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ABSTRACT

This report describes the national workshop program and participating states' follow-up activities which were a part of an administrators' national training program to improve vocational programs' cost effectiveness. It consists of an introduction and three additional chapters. Chapter 2 presents a summary of developmental strategies, nominal group meetings, analytical techniques, the small group workshops, and the results of the workshop evaluation. Summaries are given of three papers presented by guest speakers which focused on (1) improving program effectiveness, (2) increasing cost efficiency and (3) improving the cost-effectiveness of vocational programs. Chapter 3 reports the exemplary practices which were presented by each participating state and their statewide follow-up activities after the national workshop. Chapter 4 draws conclusions and makes some recommendations for future activities. The national workshop evaluation form is appended. (LRA)

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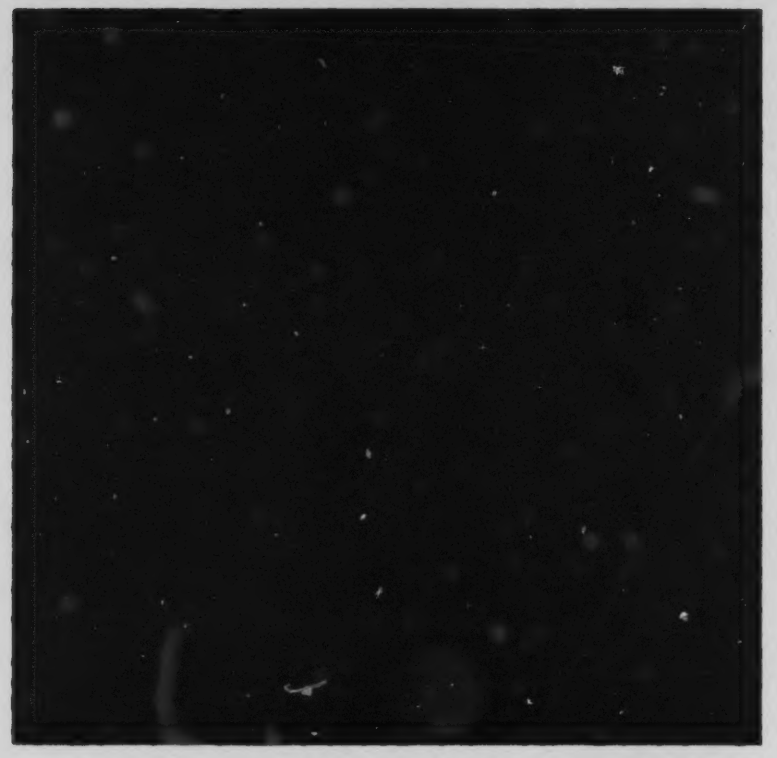
WORKSHOP REPORT

NATIONAL WORKSHOP AND STATES' FOLLOW-UP ACTIVITIES FOR IMPROVING THE COST-EFFECTIVENESS OF VOCATIONAL PROGRAMS



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December, 1978

Bureau of Occupational and Adult Education, U.S. Office of Education
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and
Indiana State Board of Vocational and Technical Education

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COST-EFFECTIVENESS STUDY PROJECTS

IN

VOCATIONAL EDUCATION

Project Director: Jin Eun Kim

1. *Development of A Cost-Effectiveness Analysis Model and Administrator's Manual for Secondary Vocational Programs: July 1, 1975 -- June 30, 1976.*

2. *Development of A Cost-Effectiveness/Benefit Analysis Model and User's Manual for Postsecondary Vocational Programs: July 1, 1976 -- October 31, 1977.*

3. *Diffusion of the Cost-Effectiveness Analysis System for Improving Secondary Vocational Program Management: January 1, 1977 -- March 31, 1978.*

4. *National Priority Training Program #1: Developmental Strategies and Analytical Techniques for Improving the Cost-Effectiveness of Vocational Programs: July 1, 1977 -- December 31, 1978.*

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Abstract

Purpose. The purpose of the national training program on improving the cost-effectiveness of vocational programs was to train vocational administrators in developmental strategies and analytical techniques for improving cost-effectiveness of vocational programs so that they may function as change agents for their statewide implementation. The specific objectives of the national workshop were: (1) to increase the participants' understanding of the cost-effectiveness strategies and techniques, (2) to improve their abilities to apply the strategies and techniques, and (3) to help them function as change agents by diffusing the new ideas and techniques of cost-effectiveness in vocational education.

Procedures. To achieve the objectives of the national workshop, two advisory committees were organized to provide advice and assistance in planning, implementing and evaluating the workshop. An agenda for the workshop programs and schedule were designed, and an application package was developed to select participating states and team members. The workshop was organized to render six paper presentations and six small group meetings, and it was conducted in Indianapolis, Indiana on March 6th-9th, 1978. The participating states each presented an exemplary practice related to the workshop topics at the national workshop and initiated their state's follow-up activities after the workshop.

Products and Results. A total of forty vocational administrators from thirteen states participated in the national workshop. The participants' responses in both structured and open question survey were strongly positive toward the workshop planning, operation, and outcomes.

Since the national workshop, eight out of the eleven selected states have conducted statewide workshops through which the Indiana cost-effectiveness analysis model and other relevant materials were exposed to approximately three hundred vocational administrators at both the state and local levels.

The six papers and results of the small group meetings are summarized in this workshop report; the complete papers and more detailed information have been combined in a handbook and published separately.

Acknowledgements

The project director wishes to acknowledge the Bureau of Occupational and Adult Education, the U.S. Office of Education, for its financial support of this project, and the Indiana State Board of Vocational and Technical Education for its co-sponsorship with the USOE. Special appreciation is expressed to Ms. Muriel Shay Tapman, National Coordinator for VEPD in the Bureau, Mr. Daryl Nichols, the former Program Officer, OAE, USOE Region Office V, and Dr. Mary Jenet Penrod, State Coordinator for Supportive Services and Program Improvement at the Indiana State Board, for their cooperation, assistance, and encouragement.

The author is most grateful to the Executive Committee and the Planning and Evaluating Committee members for their advice and assistance in planning and implementing the national workshop. The gratefulness is extended to the contributors to the workshop and the participating states' state directors and team members for their recognition of and involvement in the training program. Special indebtedness is acknowledged to paper presenters, group leaders, and project assistants for their academic contribution and professional services.

In addition, sincere thanks go to Dr. Thomas R. White, Chairperson of the Department of Vocational Education and the departmental staff for their help and assistance with the project, the editing and the typing of this report.

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DR. PAULA CARTER, Associate Superintendent, Indiana State Department of Public Instruction, served as an Executive Committee member for this workshop and presided over a paper presentation session for James Pershing.

DR. GEORGE COPA, Professor and Associate Director, Minnesota R & D Center for Vocational and Technical Education at the University of Minnesota, presented a strategy paper on *Improving Cost-Effectiveness of Vocational Programs*.

DR. LOIS-ELLIN DATTA, Assistant Director, Teaching and Learning, National Institute of Education, presented a strategy paper entitled *Inside the Black Box: Process Evaluation as a Part of Cost-Effectiveness/ Benefit Analysis*. She provided insights into the educational process as well as the resulting outcomes.

MS. DIANA DICUS, Administrative Secretary, Department of Vocational Education, Indiana University-Bloomington, served as a receptionist for participants' registration and provided administrative services for the workshop.

DR. THOMAS G. GARRISON, Former Vocational Director, Wayne Township, Indianapolis, served as a group leader for nominal group meetings and small group workshops, and presided over a paper presentation session for Don Pennington.

DR. DON K. GENTRY, Executive Officer/State Director, Indiana State Board of Vocational and Technical Education, served as chairman of the Executive Committee for the workshop. He also made a remark on the workshop program at the banquet, and presided over a paper presentation session for George Copa.

DR. RICHARD GOUSHA, Dean, School of Education, Indiana University-Bloomington, spoke at the banquet about the importance and significance of the workshop in improving vocational programs.

MS. BEVERLY HANKENHOFF, Vocational Director, New Castle Area Vocational School, served as a group leader for nominal group meetings and small group workshops, and presided over a technique paper presentation for Rod McKinney.

DR. ROBERT C. HARRIS, Associate, Education and Work Group, National Institute of Education, spoke at the banquet on cost-effectiveness studies for vocational programs.

MR. JERRY HAVILL, Project Assistant, assisted in developing the notebook for the workshop and presided over a whole group session.

DR. JIN EUN KIM, Assistant Professor and Project Director, provided leadership in planning and directing the workshop. He presented a paper on *Computing Cost-Effectiveness Measures for Vocational Education Programs* and concluded the workshop.

DR. PHILLIP MANN, State Coordinator of Evaluation, Indiana State Board of Vocational and Technical Education, presided over a paper presentation session for Jin Kim and a group presentation and conclusion session.

MR. RODERICK A. MCKINNEY, Vocational Director, Benton Community Area Vocational School, presented a paper on *Determining Program Objectives and Outcomes*, and served as a group leader for the nominal group meetings and small group workshops.

MS. INA MOSELEY, Vice-President, Indiana Vocational Association, served as a group leader for the nominal group meetings and small group workshops, and presided over a whole group session.

MS. VICKI NEAVES, Project Assistant, assisted in developing the notebook for the workshop, and presided over a whole group session.

DR. DON PENNINGTON, Vocational Director, Washington Township, Indianapolis, presented a paper on *Analyzing Program Costs*. He served as a group leader and Executive Committee member for the workshop.

DR. MARY JENET PENROD, State Coordinator, Supportive Services and Program Improvement, Indiana State Board of Vocational and Technical Education, served as an Executive Committee member for the workshop and made arrangements for hotel accommodations. She also presided over a paper presentation session for Lois-ellin Datta.

DR. JAMES A. PERSHING, Assistant Professor, Department of Vocational Education, Indiana University-Bloomington, presented a paper on *Increasing the Cost Efficiency in Vocational Education*.

DR. THOMAS R. WHITE, Chairman, Department of Vocational Education, Indiana University-Bloomington, welcomed and introduced the participants at the opening session and presided over the banquet program. He also served as an Executive Committee member for the workshop.

DR. F. ALLAN WIGGLE, Assistant Professor and In-Service Educator, Department of Vocational Education, Indiana University-Bloomington, presided over a presentation of state exemplary practices at the opening session.

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Chapter I

INTRODUCTION

This paper is a workshop report from a national priority training project #1: DEVELOPMENTAL STRATEGIES AND ANALYTICAL TECHNIQUES FOR IMPROVING COST-EFFECTIVENESS OF VOCATIONAL PROGRAMS. The project was conducted with a grant from the Bureau of Occupational and Adult Education, U.S. Office of Education, under the authority of the EPDA, Part F, Section 553.

The primary purpose of the project was to train vocational administrators selected from the participating states in developmental strategies and analytical techniques for improving cost-effectiveness of vocational programs, so that they may function as change agents in diffusing the strategies and techniques through the nation. A national training workshop was conducted, after which the participants were to initiate follow-up activities in their states.

The workshop report describes the national workshop and the participating states' follow-up activities. More detailed documents have been combined in a handbook and published separately. The objectives of the national workshop, the procedures for the workshop and follow-up activities, and the organization of this report are described below.

Objectives of the National Workshop

The national workshop was intended to train selected vocational administrators to improve the cost-effectiveness of vocational programs in

their states. By means of the intensive workshop activities, the participants were expected to:

1. Increase their understanding of the cost-effectiveness concept as a developmental strategy and an analytical technique for the improvement of vocational programs.
2. Develop a set of vocational program objectives with specific target goals in measurable terms.
3. Identify program output indicators relating to the specified program objectives.
4. Determine the direct and indirect program costs per student enrolled, per student contact hour, and per completion or graduate.
5. Compute cost-effectiveness measures of the vocational program.
6. Initiate a state and local plan for improving the cost-effectiveness of vocational programs.
7. Function as a change-agent by diffusing the new ideas and techniques of cost-effectiveness in vocational education.

Procedures for the Workshop and Follow-Up Activities

To achieve the objectives of the national workshop, two advisory committees were organized to provide advice and assistance in planning and implementing the workshop. An agenda for the workshop programs and schedule was designed, and an application package was developed to select participating states and participants. The participating states presented an exemplary practice related to the workshop topics at the national workshop and initiated their state's follow-up activities after the workshop.

Organization of Two Advisory Committees

Ten state and local vocational administrators representing each of the USOE regions constituted the Planning and Evaluation Committee for the

project. They provided advice and suggestions for developing the selection criteria as well as for planning and implementing the training activities. They also evaluated the documents developed for the workshop.

The Executive Committee, consisting of three state vocational administrators, one local vocational director, and one university professor reviewed the application forms submitted by state directors and selected the participating states. The committee members also provided advice and assistance in developing the workshop agenda and implementing the workshop.

Design of the Workshop

The national workshop was designed to enable the participants to work on two main themes: (1) developmental strategies, and (2) analytical techniques for improving cost-effectiveness of vocational programs. With regard to the first theme, three strategy papers concentrated on three topics:

1. improving program effectiveness in vocational education,
2. increasing cost efficiency in vocational education, and
3. improving cost-effectiveness of vocational programs.

Each of the strategy presentations was followed by a nominal group meeting for problem exploration and a group solution session.

For the second theme, three technique papers focused on three topics:

1. determining program objectives and outputs,
2. analyzing program costs, and
3. computing cost-effectiveness measures of vocational programs.

Following each technique presentation, a group workshop session was provided to determine program goals, to analyze program costs, and to compute cost-effectiveness measures of the given program on the basis of the simulation data and forms at each workshop. The final results from the group workshops were presented at the last plenum meeting. Thus, this workshop was system-

atically organized as a series of sequentially related paper presentations and group workshops which necessitated participants' attendance at all sessions.

At the opening session, each team leader of the participating states presented a state's exemplary practice in conjunction with the workshop topics. Upon completion of the workshop, all of the participants were requested to evaluate the workshop operation, their improvement in understanding the cost effectiveness techniques, and their perception of the characteristics of the developmental strategies and analytical techniques. The four-day workshop schedule can be found in the workshop agenda (see Appendix A).

Five experts and practitioners in vocational education were invited as guest speakers. Five people who had participated in the Indiana statewide cost-effectiveness conference were invited to serve as small group leaders.

Prior to the workshop, some cost-effectiveness reports were mailed to the eligible participants for their review. A notebook including copies of papers, materials for small group meetings, and other related information was prepared for the participants. The four-day workshop was conducted at the Hyatt Regency Hotel in Indianapolis, Indiana on March 6-9, 1978.

Selection of States and Participants

An application package was developed to include announcement letters, selection criteria statements, requirements, and application forms (see Appendix B). The participating states were selected on the basis of a review of their applications.

Three criteria for selecting states and participants were developed with approval of the advisory committees. The criteria were as follows:

1. The state must be willing to conduct a statewide workshop or alternate activity which would in the state's judgment have statewide impact on improving cost-effectiveness of vocational programs after participating in the national workshop (March 6-9, 1978).

2. The state should have an exemplary practice to improve program effectiveness, cost efficiency and/or cost-effectiveness which will be shared with other participants at the national workshop.

3. The team participants should have some background in program evaluation, planning-programming-budgeting systems, cost analysis, and/or cost-effectiveness analysis with respect to vocational programs.

Some additional considerations were enumerated to help the state director select three state team members.

A package of application forms and relevant information was mailed to the fifty state directors and five territorial directors for vocational education. Then, states which were interested in participating in the workshop were requested to submit an application form which included the names of the three recommended team members, an affirmation of the state director's commitment, a tentative plan for the statewide follow-up activity, and a summary of the exemplary practice to be presented at the national workshop.

A total of 17 applications were received, and the project staff and the Executive Committee members reviewed the applications and selected ten states and one U.S. territory. They were: California, Florida, Kansas, Maine, Michigan, New Jersey, New Mexico, Oklahoma, Puerto Rico, West Virginia, and Wisconsin. In addition, the state of New York participated in the workshop at its own expense.

Three team members, upon the recommendation of the state director, were invited from each participating state for the national workshop. A total of 40 people attended the workshop. The participants consisted of 19 state personnel, 15 local directors, 5 university teachers, and 1 graduate student. The participants were randomly divided into five small groups. The same group members worked together at all the group sessions under the guidance of a group leader. The names and addresses of the participants are listed in Appendix C.

Follow-Up Activities

After the national workshop, the participating states were required to conduct state workshops or an alternative activity as a follow-up. Seven states and one territory have already conducted their workshops, and the project staff has provided presentations and assistance for small group meetings. The remaining three states will conduct workshops in the near future.

Organization of Report

This report describes the national workshop program and activities and the participating states' follow-up activities. It consists of an introduction and three additional chapters.

Chapter II presents a summary of developmental strategies, nominal group meetings, analytical techniques, the small group workshops, and the results of the workshop evaluation.

Chapter III reports the exemplary practices which were presented by each participating state at the national workshop and their statewide follow-up activities after the national workshop.

Chapter IV draws conclusions and makes some recommendations for future activities.

Chapter II

NATIONAL WORKSHOP ON IMPROVING COST-EFFECTIVENESS OF VOCATIONAL PROGRAMS

This chapter presents a summary of developmental strategies, nominal group meetings, analytical techniques, small group workshops, and the results of the workshop evaluation.

Developmental Strategies and Nominal Group Meetings

Three strategy papers were presented by guest speakers at the national workshop. The papers focused on: (1) improving program effectiveness, (2) increasing cost efficiency, and (3) improving the cost-effectiveness of vocational programs. The Nominal Group Technique was applied to identify organizational and personal problems in each developmental strategy.

Improving Program Effectiveness

Dr. Lois-ellin Datta presented strategies for improving program effectiveness in her paper entitled "Inside the Black Box: Process Evaluation as a Part of Cost-Effectiveness/Benefit Analysis." She discussed four topics: (1) the need for process evaluation, (2) various causes of ineffectiveness, (3) planning for program information, and (4) some general strategies for program improvement. Her presentation is summarized below.

The Need for Process Evaluation. Cost-effectiveness/benefit analysis provides a valuable contribution to planning and evaluation of vocational programs. The resulting measures are useful indicators for further inquiry

into what is happening in the program. However, a search for what action should be taken requires collection of process data linking inputs to outputs. Simply identifying a program as ineffective or inefficient may not provide information adequate to determine how the program should be modified or deleted, or whether a new program should be developed.

In planning stages it is necessary to build in process evaluation of vocational programs in order to avoid uncertainty about how to improve program effectiveness after the program is established. Procedures for evaluation of the process should be determined so that pertinent data can be collected at specified intervals. Through this process, the resulting analyses will provide clues to the reasons for less-than-perfect effectiveness.

Some Various Causes of Ineffectiveness. Possible reasons for the ineffectiveness of vocational programs are to be found in the areas of enrollment, completion, and employment. Turning first to enrollment -- some causes of ineffectiveness might be that:

- Information about the program was not available equally to men and women.
- The course might be differentially attractive to men and women.
- Parents or spouses might not support student enrollment.
- Enrollment is first-come, first-served.
- The time, costs, or location are convenient to only one gender.
- Instructor's or counselor's attitudes discouraged students from trying out nontraditional areas.
- More pro-active counseling was needed in gender-fair enrollments.

- Rate of change is already high even if absolute level is less than one hundred percent.

Possible reasons or explanations for low completion rates in vocational programs might be that:

- Learners were leaving when their own goals were achieved.
- Learners found that the prospectus and the content differed.
- The primary reason for enrollment was to qualify for other benefits.
- Teaching may have been poorly suited to the learners.
- Equipment and facilities might be inadequate.
- The course may be part of a larger program or school which is poorly administered.
- Lack of funds or family pressure might prevent completion.
- Students may have been improperly selected.

Some of the following might be considered reasons for high placement rates:

- High employment rates could be due to an unprecedented, one-time expansion of the job market.
- High employment rates could be due to an aggressive placement system for that program.
- High employment rates might be a by-product of low completion.
- High employment rates might be due to the low attractiveness of other alternatives.
- Excellent technical training may be the basic reason for high effectiveness ratios on employment.
- Graduates possess desirable worker habits due to the program itself.

- Applicants are selected to be highly employable.
- Employers may be offering highly desirable working conditions.

Planning for Program Information. In determining appropriate actions after the effectiveness data have been reported, a systematic effort should be made to identify alternative reasons for low or high effectiveness measures and to collect more complete information related to the reasons. During the next few years, extensive process evaluation of vocational programs will be made through the National Vocational Education Data System and through the collection of data provisionally required for the state in in-depth reviews. Along with these efforts, cost-effectiveness/benefit analysis may provide even more useful insights into decisions regarding the program operation.

Strategies for Improvement of Program Effectiveness. In an effort to improve the effectiveness of vocational programs, four general strategies are suggested: (1) changing the nature of the population served, (2) changing the program, (3) changing the environment in which the program is operated, and (4) leaving the program alone.

1. Not all programs can be everything to everyone. If alternative programs of greater effectiveness for students who should be screened out are available, the selective recruitment could improve efficiency as well as effectiveness. Another approach to a "differential students" strategy is greater cooperation between vocational programs and feeder schools.
2. Changing the program could include varying access, content, and teaching/learning processes.
3. Among approaches to changing the environment, improvement of the working climate, and cooperation between community service agencies, employers, and labor unions to improve human resources support can considerably improve the effectiveness of vocational programs.

4. Leaving the program alone may be the most sensible choice when there are no other alternatives, where progress is being made at an acceptable rate, and where the probable increase in effectiveness due to changes is low.

These four broad strategies may be useful categories for thinking about development of alternatives. The best answers to improved effectiveness, however, rest in greater understanding of what inside the *black box* of individual state and local program operations influences the measures of effectiveness selected.

Increasing the Cost Efficiency of Vocational Education

Dr. James A. Pershing shared ideas on increasing the cost efficiency of vocational education. He presented a concept of cost efficiency, then proceeded to discuss its applicability to vocational education. Several problems with operationalizing the concept were explored as were the benefits that can be derived from using it as a decision-making tool in vocational education. His paper is summarized below.

The Concept of Cost Efficiency. Cost efficiency has developed in the domain of economics; therefore, some background of economic theory must be provided. Economics is concerned with the best way of allocating scarce resources among various alternative uses to make some individual or group as well off as possible. However, it should be understood that economics is a tool to guide one's thinking, not an answer to the world's problems.

Cost efficiency, therefore, can be seen as an application of economic principles to actual problems of decision-making. The concept is based on micro-economics; that is, the behavior of specific economic units. In short, to be cost efficient implies that a particular level of performance is achieved

using the least possible resources, and this is a desirable goal. The problem is the determination of cost efficient alternatives. This requires operationalization of the concept.

Some Ideas or Practices for Increasing Cost Efficiency. By utilizing the systems perspective, a cost can be assigned to vocational education inputs. Efficiency concerns can be focused on the processing stage. Goals and objectives of vocational education can be translated into desirable outputs. Therefore, to increase the cost efficiency of vocational education programs, the first concern must be with clarifying goals and objectives of the vocational education system. Goals and objectives may include the following:

1. to increase the number of students served,
2. to decrease the number of dropouts from the program,
3. to increase the training-related-placements of program completers,
4. to increase the number of program completers,
5. to increase the number of students continuing education after completing the program,
6. to increase the labor force participation of program completers,
7. to meet the vocational interests of students,
8. to decrease program costs,
9. to increase enrollments of males or females in traditionally sex biased programs, and
10. to increase the number of students served from disadvantaged families.

With regard to vocational education inputs, including human and material resources, several approaches can be applied to decrease their costs or improve their quality.

By focusing attention on the student's learning process, several ideas or practices are available for increasing cost efficiency. They are:

1. decreasing the time length of multi-year or multi-semester programs,
2. using individualized instruction,
3. using the cooperative instructional process,
4. developing open entry and open exit programs,
5. employing paraprofessionals as teacher aides,
6. using computer assisted and computer managed instruction,
7. team teaching,
8. contracting with private schools or business and industry for instruction,
9. flexible scheduling,
10. recognize learning that has already occurred in other settings and credit such learning.

Problems and Concerns. The ideas or practices mentioned above regarding vocational education outputs, inputs, and processes are applicable to increasing the cost efficiency of vocational education. Although the cost efficiency concept is a very clean and neat tool for economic analysis, numerous conceptual and measurement problems arise when the concept is applied to vocational education. These problems include the following:

1. Prescriptive federal legislation and a long and illustrious history have not given vocational education clean and attainable goals.
2. Numerous conceptual and practical problems exist in trying to quantify the costs of vocational education program inputs.
3. In determining costs, average unit costs are considered instead of incremental costs.
4. External costs not borne by the agency responsible for the program are ignored.

5. Inputs are not always used by the production unit that pays for them.

6. The sensitivity of cost and efficiency calculations are inadequately examined.

7. Cost efficiency analysis is much more useful for altering or otherwise improving the effectiveness of a program than for making comparisons between programs.

8. The specification and measurement of inputs to the process by which vocational capabilities are imparted to students suffer from the lack of a widely accepted theory of learning.

Many decisions must be made regarding the allocation of resources among competing vocational education programs. Under the circumstances, cost efficiency analysis, with all of its shortcomings, forces the decision-maker to concentrate on program costs, the efficiency of the instructional process, and the objectives of the program. The decision-maker is required to state explicitly and systematically the manner in which decisions are reached. As a way of thinking, cost efficiency analysis provides a rational and systematic analysis for an area that has been dominated by subjective judgment and impressionistic analysis alone.

Improving Cost-Effectiveness of Vocational Education Programs

Dr. George Copa provided some insight into understanding how the information derived from the cost-effectiveness analysis can be utilized for decision making. His presentation focused on three major topics in building the framework for decision making: (1) the major management decisions which affect vocational education; (2) alternative concepts of the purposes of vocational education and hypothetical examples of how these purposes can be served; and (3) economic principles which can be used as a guide for sorting through and organizing existing and potential information

relating effectiveness to costs. Dr. Copa's paper is briefly summarized below.

The Major Management Decisions Affecting Vocational Education. The decision classification schemes are scale, product mix, production function, schedule, and location. Decisions of scale involve determination of how much vocational education should be provided. These decisions should be made on the basis of benefits that vocational education can produce more efficiently than competitors and the value of those benefits relative to the benefits of other services which could be provided with public funds.

Based on scale decisions, product mix decisions concern the purpose and content of the programs. These decisions concentrate on the internal allocation of resources within vocational education. Production function is concerned with how the vocational education outputs will be produced. Goals must be determined and decisions made about the allocation of resources to meet the program mix goals. Decisions about schedule refer to the timing of vocational education services and range from whether to add or delete programs to when a given program should be operated. Location decisions refer to nondiscriminatory program access for potential consumers of the service. The decisions used for illustration in the paper are those of product mix and production function.

Alternative Concepts of the Purpose of Vocational Education. Alternative concepts of the purpose of vocational education are presented to provide a context in which to examine the usefulness of cost-effectiveness analysis in improving vocational education. An attempt is made to indicate there is no consensus on the purpose of vocational education and, therefore, on the measures of effectiveness for vocational programs.

Four alternative concepts are selected which include serving the occupational needs of industry, student needs, mutual benefits for students and industry, and market success. A series of hypothetical examples illustrate how these various purposes impact on the resource allocation consequences. The alternative purposes result in important differences in the allocation of the resources among vocational programs, and the differences act to limit the generalizability of cost-effectiveness analysis results even at the program level within a single institution. Accordingly, it is emphasized that understanding of the educational purposes and resource allocation process is necessary for analyzing the cost-effectiveness of vocational education programs.

The Use of Economic Principles in Improving Cost-Effectiveness of Vocational Education. Some economic principles provide a more generalizable set of guidelines for decision-making than does a listing of specific activities for improving cost-effectiveness of vocational programs. Economic principles which concern the analysis of how inputs relate to each other and to outputs include: (1) diminishing returns; (2) opportunity costs; (3) equal-marginal returns; (4) fixed and variable costs; (5) resources substitution; and (6) product substitution.

1. The diminishing returns principle concerns the relationship of a single input to a single output, given that all other inputs are held constant. The principle states that as the variable input is added, the marginal output declines after an initial stage of increasing marginal output.

2. Opportunity costs explain the cost of using an input in one way in terms of the output that would be obtained from using it in the next best way. The principle of opportunity cost is especially useful in allocating resources between alternatives.

3. Using the principle of opportunity costs, resources are allocated among alternative uses sequentially from the highest to the lowest marginal increase in output of the next best use of the resources. Allocating resources in this way tends to equalize opportunity costs among alternatives. This represents the principle of equal-marginal returns.

4. The fixed and variable costs concepts become important when estimating added costs of making changes in the program. Fixed costs are those costs which do not change with changes in output. They go on whether anything is produced or not. Variable costs, or operating costs, vary with the amount of output. Variable costs can be increasing, constant, or decreasing.

5. The principle of resource substitution is useful in management decisions concerning resource allocation to inputs which substitute for one another in the same process.

6. The principle of product substitution deals with the relationship between two outputs. As resource substitution aids in decisions about how much of competing inputs are to be allocated, product substitution aids in determining the amounts of competing outputs that are desirable.

These economic principles are useful as guides to sort through and organize existing and potential information related to costs and effectiveness. The information provided when these principles are applied can serve to improve vocational education in a world of continually scarcer resources.

Nominal Group Meetings

After each paper presentation, a nominal group meeting was held to identify problems in implementing developmental strategies. Following the nominal group procedures, five small groups explored, discussed, and voted on the relative importance of various organizational and personal problems in each developmental strategy. Five top priority problems identified by each group were presented at general sessions and discussed among the groups.

The Nominal Group Technique. The Nominal Group Technique (NGT) was developed by Andre L. Delbecq and Andrew H. Van de Ven in 1968. It is a structured group meeting which proceeds along the following format (Delbecq, Van de Ven, & Gustafson, 1978):

1. silent generation of ideas in writing;
2. round robin feedback from group member to record each idea in a terse phrase on a flip chart;
3. discussion of each recorded idea for clarification and evaluation; and
4. individual voting on priority ideas with the group decision being mathematically derived through rank-ordering a rating (pp. 7-8).

The Nominal Group Technique was employed to identify organizational and personal problems in: (1) improving program effectiveness, (2) increasing cost efficiency, and (3) improving cost-effectiveness of vocational programs. For nominal group meetings, small group rooms were made available and were properly equipped. A large flip chart was placed at the head of each table for the recording of group responses. The following step-by-step activities occurred during the 90 minute period:

Step 1: Leader's introduction: 10 minutes

Step 2: Generation of questions in writing: 15 minutes

Step 3: Round robin recording of problems: 30 minutes

Step 4: General discussion of the problems for classification: 15 minutes

Step 5: Silent listing and ranking of priorities on 3" x 5" cards: 15 minutes

Step 6: Voting on problem priorities: 5 minutes

Identification of Problems. Five top priority problems, in the order determined by each group, were presented at the general session. They were combined to identify problems most importantly weighted by the entire group.

In improving the effectiveness of vocational programs, the five top priority problems identified by the entire group were: (1) lack of consensus on goals/definitions/criteria, (2) limited resources, (3) lack of adequate information, (4) resistance to change, and (5) turfmanship. The five top priority problems in increasing cost efficiency of vocational education were identified as: (1) ignorance of cost efficiency techniques, (2) class size/student recruitment, (3) lack of adequate budgeting and accounting systems, (4) cost of data collection/inaccurate data, and (5) political influences and rigid fiscal procedures. In improving the cost-effectiveness of vocational programs, the five top problems were identified as: (1) lack of reliable data/follow-up studies, (2) fear of results/manipulation, (3) communication, (4) financial resources, and (5) lack of uniform cost-effectiveness techniques and personnel qualifications.

In addition to these problems, others frequently mentioned dealt with personnel training and capacities. Lack of adequate in-service training and staff's inability to use cost-effectiveness approaches were thought to be serious obstacles to the improvement of vocational education programs.

Generally, it was thought that there was an acute need to train vocational administrators in planning and managerial skills and to develop data systems to improve the effectiveness and efficiency of vocational education programs.

Analytical Techniques and Small Group Workshops

A series of three papers dealing with (1) determing program objectives and outputs, (2) analyzing program costs, and (3) computing cost-effectiveness measures were presented to provide the participants with analytical techniques for vocational program evaluation. After the presentation of each paper, small groups practiced the techniques on hypothetical vocational programs assigned to each group.

Determining Program Objectives and Outputs

Mr. Roderick A. McKinney explained the rationale and procedures for determining program target goals, as specified in the Indiana Cost-Effectiveness Analysis Model (Kim & Harris, 1976). He also explained the training experience at the Indiana State Workshop and the practical application of the model. His presentation is summarized below.

Rationale or Assumptions. Program objectives are defined as specified target goals to be attained by the vocational instructional programs offered at comprehensive high schools or area vocational schools. The objectives of vocational programs can be formulated by the vocational administrators at the local school district, whose decisions would be based on the state goals and objectives. However, there are differences in local community demands and student characteristics from district to district. Therefore, the goals should reflect the program needs and requirements of the local district as well as statewide goals and objectives. Furthermore, it is assumed that:

1. Objectives and/or goals for instruction have long been an integral part of vocational education.

2. Vocational education courses are student electives; hence, students have career goals.

3. Vocational education is an accepted part of the secondary education system.

4. Vocational education attempts to weld the needs of students, needs of the business community, and the objectives of the secondary school.

5. Follow-up and placement are considered a part of the total vocational education program.

6. Vocational education provides a source of trained personnel for the business and industrial community.

Procedures for Target Goal Determination. A set of program objectives was developed in the Indiana Cost-Effectiveness Analysis Model. They are stated as follows:

1. Aid students enrolled in vocational education to successfully complete a secondary occupational program.

2. Assist special student groups to successfully achieve in a secondary vocational program.

3. Provide vocational education for secondary school youth in accordance with their occupational preparation.

4. Provide leadership activities for students enrolled in vocational programs through a youth organization functioning as an integral part of the vocational instruction.

5. Provide guidance and counseling services (career development) information appropriate to continued education or employment for students enrolled in vocational programs.

6. Provide vocational programs to fulfill the requirements of the labor markets and the employment community manpower needs.

7. Encourage vocational graduates to continue their education after completion of their secondary program.

The model requires that each of these program objectives be specified in measurable terms as to degrees of its attainments. Target goals of the vocational program can be determined through the following steps:

1. By defining program objectives and target goals which are anticipated outcomes of the program.
2. By describing each objective and target goal in measurable terms.
3. By selecting appropriate objectives for a specific vocational program. In the selection process, a percent and/or number for each target goal is determined.
4. By collecting follow-up information after the completion of the training program.
5. By identifying outcome indicators from the student records and follow-up information.
6. By comparing actual outcomes from the program with the respective target goals to measure program effectiveness.

Indiana State Workshop. In June of 1977, a statewide workshop on cost-effectiveness analysis of secondary vocational programs was conducted for Indiana vocational administrators. Participants in the workshop had the opportunity to practice cost-effectiveness analysis of vocational programs using the documents provided in the Indiana model. The workshop participants had to attend the entire program since the workshop program was organized into sequential activities. The majority of participants were convinced that the cost-effectiveness model could be a useful tool for analyzing the cost-effectiveness of their vocational programs. More detailed information is available in the diffusion report (Kim, 1978).

Practical Application. To conduct a cost-effectiveness analysis, a study plan and a time schedule of activities should be developed. In the

planning phase, the following questions need to be answered:

1. Why do you need the analysis?
2. What information do you need?
3. What programs will you analyze?
4. What time period will you consider?
5. How will you analyze?

Then design the study plan to include:

1. the types of data needed,
2. the availability of data,
3. data collection instruments, and
4. a time frame for the study.

In implementing the study, the first step is to determine program objectives and target goals. The materials and guidelines contained in the Administrator's Manual (Kim, Harris, & Ruby, 1976) will be useful in completing the study.

Analyzing Program Costs

Dr. Don Pennington defended the rationale for program costs analysis in vocational education against criticisms expressed by school personnel. Then he explained the program cost analysis scheme as developed in the Indiana Cost-Effectiveness Analysis Model and discussed the implications of designing a cost analysis system to provide information and service to many different groups.

Rationale for Program Cost Analysis. During the past few years there has been an increasing interest in the expenditures for education. Many states have mandated systems of cost accounting and reporting which identify the specific costs associated with operating programs by level or by type of

instruction. At the same time, extensive criticisms have been expressed by school personnel about the implementation of a cost accounting system. The criticisms include the following:

1. School districts have insufficient financial resources to develop and implement a cost accounting system.
2. There is insufficient staff time, especially for top administrators, to implement a system.
3. Staff doesn't understand the concepts associated with a cost accounting system.
4. Staff lacks the necessary analytical skills.
5. Such a system would increase the paperwork.
6. The system may require computer time for implementation in a large school district.
7. It is difficult to get the educational community to think in terms of cost-effectiveness.
8. The guidelines from the state and/or national offices will not meet local needs; therefore, local officials will only go through the motions.
9. The program objectives will be established without the involvement and commitment of subordinates.
10. The system will be thought of as an end in itself rather than a means to an end.
11. The system will be treated as decision making rather than as a tool of decision makers.
12. The system will be seen as a tool of the top level by the lower level which will result in a lack of commitment on the part of subordinates.
13. The public will see the system as a way to provide output information, while school personnel will focus upon input information.
14. Teachers may view the system as an intrusion upon their academic freedom.

Even though many of the criticisms are legitimate, the barriers in most cases should be surmountable by school administrators. It is imperative

that vocational educators provide the leadership in developing a system that links obtained outcomes to expenditures; in the past, costs have been presented in isolation. Analysis of program costs is necessary if the limited resources are to be utilized in the most efficient and effective manner.

Methods of determining program costs vary from one state to another and from one local district to another. School districts use different bases and means for determining costs. There is no consistency from one vocational school to another in cost definitions. Under such circumstances, the need for a unified system of cost analysis to provide meaningful program cost data is undeniable.

Program Cost Analysis Scheme. As a part of the Indiana Cost-Effectiveness Model, a program cost analysis scheme was developed which defined program costs as annual expenditures for operating the vocational program at the local level. The scheme includes two types of expenditures -- direct and indirect costs. Direct costs include items such as:

1. Salaries of instructional staff
2. Fringe benefit costs for instructional staff
3. Program travel costs
4. Costs for instructional supplies and materials
5. Equipment purchases
6. Equipment depreciation
7. Building use cost
8. Other identified costs

Indirect costs are the expenditures for supporting services that cannot be identified for a specific program. These expenditures are prorated among the various programs. Indirect costs include such items as:

1. Student support services
2. Instructional staff services
3. General administration services
4. School administration services
5. Business services
6. Central support services

There are many methods of prorating indirect costs, but it is important that these expenditures be prorated on the basis of appropriate criteria. For that purpose, some basic criteria were suggested for prorating indirect costs among vocational programs. Once the indirect costs have been prorated to a specific vocational program, they can be added with the direct costs to provide the total cost of operating the program.

Practical Implications. Cost analysis is an important function in the operation and administration of schools. Without an adequate system to indicate what has happened or is happening in an educational program, management decisions and policies must be based on memory or guesswork. The development and implementation of a system for cost analysis will improve many services or functions needed for effective administration of vocational programs. Finally, the system for cost analysis may differ according to the needs and purposes, but a model system should adhere to the following criteria:

1. The system should be adequate to provide financial and related operational information for all interested parties.
2. The system should be designed to ensure accuracy and a reasonable degree of internal control. If so designed, it will automatically assist those involved in the administration of the programs.

3. The system should be consistent with generally accepted governmental accounting principles, and be consistent between one period of time and another. Valid comparisons can be made only if the items are treated in the same manner.

4. The system should be flexible. Change is inevitable. New programs will develop; old programs will be dropped. Provisions should be made for taking care of changes with as little disruption as possible.

5. The system should be uniform. To permit maximum usefulness, it should allow for financial, operational, or performance comparisons.

6. The system should be as simple as possible and still fulfill the pertinent requirements. It is essential that the system not become merely frustrating "busy" work. It should assist in improving the educational processes, not hinder them.

7. The system should provide ready access to information about individual programs.

Computing Cost-Effectiveness Measures

Dr. Jin Eun Kim explained the relationship of the cost-effectiveness analysis technique to management systems such as accountability, planning-programming-budgeting (PPB), and management by objectives (MBO). Then he presented the formulas and procedures for computing the cost-effectiveness measures and explained how to interpret and utilize the measures for vocational program evaluation and planning.

Cost-Effectiveness Analysis and Management Systems. Cost-effectiveness analysis can be defined as a technique for assessing outputs of existing and/or new programs in relation to their specified program objectives and against the costs of those programs. The cost-effectiveness analysis technique is useful in an accountability system which emphasizes the attainment of objectives as well as the allocation of resources. As a means to optimize the relationship between resources and results, an accountability system

demands careful specification of objectives and subsequent measurement of achievements. It also requires the measurement of effectiveness and efficiency, both of which are derivable from the cost-effectiveness analysis.

The PPB system has three essential characteristics: (1) the structural aspects which are concerned with establishing a set of categories oriented primarily toward the end product or end objective, (2) analytical process considerations for the examination of alternative courses of action, and (3) information system considerations for progress reporting and control. The cost-effectiveness analysis technique can be used for the examination of alternative courses of action. The technique increases the potential of the PPB system by providing decision-makers with refined information on program effectiveness and cost implications in terms of achieving the stated objectives.

The MBO concept was developed to direct the vision and efforts of managers toward a common goal. With primary emphasis upon the management functions of planning and controlling, a management by objectives system is designed to determine: (1) what must be done, (2) how it must be done, (3) when it must be done, (4) how much it will cost, (5) what constitutes satisfactory performance, (6) how much progress is being achieved, and (7) when and how to take corrective action. As a planning and control approach, the MBO concept stresses specification of objectives, organization of resources to achieve the objectives, and evaluation of individual performances and goal attainments as a whole. Accordingly, an MBO system can utilize the cost-effectiveness technique and measurement to aid in evaluating performance and goal attainments.

As briefly reviewed above, these management systems may employ analytical procedures and quantitative measures to improve the administration of vocational programs. There are three common elements to the four concepts. They are: (1) objectives or goals, (2) results or outcomes, and (3) resources or costs. Each of these three elements should be specified in measurable terms and quantified to help compute the degree of managerial performances for vocational programs. The specification of the three elements and the identification of three kinds of analytical measures are extremely important in applying PPBS and MBO to local school systems, and eventually in improving the accountability system in vocational education.

Cost-Effectiveness Measures. In developing the Indiana Cost-Effectiveness Analysis Model, the primary effort was to specify the three main elements of objectives, outputs, and costs of vocational programs, and to generate three kinds of cost-effectiveness measures called: (1) program effectiveness, (2) cost efficiency, and (3) cost-effectiveness and performance ratio. The formulas and computing procedures for these measures are described below.

First, effectiveness is defined as a measure of the achievement of program objectives. Program effectiveness scores are computed by dividing the actual outputs by the anticipated target goals. Furthermore, a number of effectiveness scores can be combined into a program effectiveness index. A composite program effectiveness index is made by adding all available effectiveness scores. Dividing the composite index by the number of effectiveness scores provides an average program effectiveness index. If each program's effectiveness score is weighted on the basis of policy preferency or the importance of its objectives, a weighted composite program effectiveness index and a weighted average program effectiveness index can be made in the same way.

Second, cost efficiency is determined by dividing total costs of the program by units of outputs, such as total number of program completions or graduates. Unit costs per student and per student contact hour are found by dividing the annual total costs of the instructional program by the total number of students enrolled in the program and by the total number of student contact hours within the program, respectively. A cost efficiency index can be derived from the division of the actual total or unit cost by the budgeted total or unit cost for the vocational program. If average or standardized unit cost information is available, the actual unit cost can be compared with the average or standardized unit cost to produce a cost efficiency index.

Finally, based upon the measures of program effectiveness and cost efficiency, a cost-effectiveness ratio and a performance ratio can be computed. A cost-effectiveness ratio indicates the degree of goal attainments per unit cost. A performance ratio is generated from the division of the program effectiveness index by the cost efficiency index. The performance ratio is a precise index representing the degree of managerial performance, and it indicates the relationship between program effectiveness and cost efficiency.

Interpretation and Utilization. After the cost-effectiveness measures are computed and interpreted, they can be used in the decision-making process for program evaluation, development, and planning. The mathematical results are simpler than the actual situations from which the cost-effectiveness measures are derived. Therefore, the results should be interpreted carefully, and the procedures for determining target goals, assessing outcomes, and analyzing program costs should be reviewed. Special consideration

should be given to identifying some influential factors which might have resulted in the measures.

The interpretation of the results may provide answers to the following questions: (1) How effective is the program? (2) How efficient is the program? (3) What is the relationship between program effectiveness and cost efficiency? If two or more programs are compared, answers may be provided to these questions: (1) Which program is most effective? (2) Which program is most efficient? (3) Which program is most effective and efficient? Thus, cost-effectiveness measures can be used for program evaluation purposes. Relative judgments can be made by ranking programs in order. The measures can lead to a final decision about strategies for increasing program effectiveness and/or cost efficiency. If a program is found to be very ineffective and inefficient, a judgment can be made as to whether the program should be modified or deleted, or whether a new program should be developed.

Furthermore, these measures provide a basis for planning and improving vocational education programs. Based on the program evaluation, a short-range (one or two-year) plan can be developed for increasing program effectiveness and/or cost efficiency. A long-range (five-year) plan can be made for the overall improvement of vocational programs as well as for the development of new vocational programs.

Although they make a reliable contribution to the decision-making process, the measures are not designed to be the exclusive criteria for judgments. Also, cost-effectiveness measures should be continuously made. The accumulated data derived from repeated measurements will increase the usefulness of the cost-effectiveness technique in analyzing program effectiveness, cost efficiency, and management performance of all educational programs.

Small Group Workshops for Cost-Effectiveness Analysis

After each of the technique papers was presented, small groups practiced, according to the paper's topic, the techniques for determination of program objectives and target goals, or analysis of program costs, or computation of cost-effectiveness measures.

Determination of Program Target Goals. Using hypothetical information for a local high school with five vocational programs, the group members worked first on setting target goals and their priorities for the assigned program. For this purpose, the participants were provided with a guide, program objectives, and target goal statements.

Analysis of Program Costs. At the second group workshop, the members computed the direct cost, indirect cost, and total cost of the program on the cost analysis form developed by the project staff. They also computed an actual unit cost by dividing the total cost by the number of enrollments in the program, and figured a cost efficiency index by dividing the actual unit cost by the budgeted unit cost.

Computation of Cost-Effectiveness Measures. At the final workshop, the group members practiced computation of cost-effectiveness measures using program target goals, program costs, and program output information provided by the project staff.

Program effectiveness scores were computed by dividing the actual outputs by the target goals. The program effectiveness scores were combined into a composite effectiveness index, and the composite effectiveness index was divided by the number of program effectiveness scores to produce an average effectiveness index. In the same way, weighted composite and average effectiveness indices were computed.

A cost-effectiveness ratio was made by dividing the average effectiveness index by the actual unit cost, and a performance ratio was made by dividing the average effectiveness index by the cost efficiency index.

Group Presentations and Comments. The cost-effectiveness measures computed by the various groups were presented to all participants and discussed. Some participants thought it difficult to interpret the measures and discussed how to utilize them without causing misunderstanding or misguidance in the decision-making process. Some of those comments are illustrated below:

1. Careful consideration should be given to interpreting the measures and identifying effectiveness and efficiency of vocational programs.

2. The measures may serve as an indicator of what is happening in the program and may indicate a need for further investigation of the possible reasons for the results.

3. The cost-effectiveness measures of vocational programs should not be compared within or between school systems unless the relevant variables are compatible.

4. Cost-effectiveness analysis is intended for use as a tool in the decision-making process and should not be used for political issues.

5. The analysis is to be used for longtitudinal comparison of effectiveness and efficiency and for performance measures which are based on historical data regarding vocational programs.

Evaluation of the National Workshop

At the final session, a workshop evaluation survey was conducted to measure the participants' satisfaction with the workshop operation, their improvement in the cost-effectiveness techniques and strategies, and their perception of the characteristics of the developmental strategies and ana-

lytical techniques. Thirty participants completed the workshop evaluation form (Appendix D).

The percentage of the respondents on a low-high (1 through 5) scale was computed for each item. The degree of satisfaction, improvement, and perception was weighted by five, four, three, two, and one points, and a weighted average point was computed by item. In addition, a group mean and standard deviation were made on the basis of the weighted average points. The results of the workshop evaluation follow.

Participants' Satisfaction

To the first question about the degree of the participants' satisfaction with the workshop operation, the majority of the participants expressed satisfaction with paper presentations, group discussion, and workshop implementation. About 20 percent of the participants indicated less satisfaction with some sub-items such as opportunity for questions at the paper presentation, amount of time allotted to group discussion, opportunity to socialize, and the time schedule of the workshop.

On the whole, a group mean of the participants' satisfaction with the workshop operation was 4.054 on the five-point scale with a relatively wider variety of individual responses (S=1.510) as shown in Table I. The weighted average of all items was above the middle point of three. The most highly rated items (over an average of four points) were ideas or issues presented and discussed, relevance of content, opportunity for participation in group discussion, opportunity for professional development, amount of materials received, and workshop location and facilities.

TABLE I

PARTICIPANTS' SATISFACTION WITH THE WORKSHOP OPERATION

Item		Low - High (%)					
		1	2	3	4	5	$\bar{X}$
With regard to paper presentations:							($\bar{X}$=3.9)
1.1	Ideas or issues presented	--	--	34	20	46	(4.1)
1.2	Opportunity for questions	10	10	20	30	30	(3.6)
1.3	Relevance of content	--	3	34	30	33	(4.1)
1.4	Effectiveness of delivery	--	7	48	25	10	(3.6)
With regard to group discussions:							($\bar{X}$=4.2)
1.5	Ideas or issues discussed	--	3	7	50	40	(4.3)
1.6	Opportunity for participation	--	--	4	16	80	(4.7)
1.7	Relevance of content	--	--	23	43	34	(4.1)
1.8	Amount of time allotted	7	16	27	13	37	(3.6)
With regard to the workshop implementation:							($\bar{X}$=4.1)
1.9	Opportunity to socialize	--	23	16	37	24	(3.6)
1.10	Amount of materials received	--	3	14	46	37	(4.2)
1.11	Usefulness of materials received	--	3	34	33	30	(3.9)
1.12	Opportunity for professional development	--	3	17	46	34	(4.1)
1.13	Organization and operation of the workshop	3	3	27	47	20	(3.8)
1.14	Time schedule of the workshop	7	13	27	37	16	(3.4)
1.15	Workshop location and facilities	--	3	4	10	83	(4.7)

Group Mean ($\bar{X}$) = 4.054 $\quad S = \sqrt{\frac{x^2}{n}} = 1.510$

Participants' Improvement

The second question was concerned with the extent to which the workshop had improved the participants' abilities in cost-effectiveness strategies and techniques. As Table II indicates, more than forty percent of the participants believed they had improved (rating 4 or 5) their understanding of the cost-effectiveness concept as a developmental strategy and analytical technique, their ability to develop strategies for increasing program effectiveness and cost efficiency, their ability to apply analytical techniques, and their ability to compute cost-effectiveness measures. About forty percent of the participants were less sure (rating 1, 2, or 3) they had improved in developing strategies for improving the cost-effectiveness of vocational programs.

The weighted average of all items was the middle point of three. As a whole, a group mean over the twelve items was 3.232.

Participants' Perception

With regard to the characteristics of the cost-effectiveness strategies and techniques, more than forty percent of the participants' perceived positively the relative advantage, compatibility, and trialibility of the developmental strategies, and the compatibility and trialibility of the cost-effectiveness techniques. More than fifty percent of the participants responded negatively regarding the observability of the developmental strategies and the easiness and feasibility of the cost-effectiveness techniques (see Table III).

A group mean over the ten items was close to the middle point of three with a slight deviation in individual responses. However, the

TABLE II

PARTICIPANTS' PERCEPTION OF THEIR IMPROVEMENT IN UNDERSTANDING COST-EFFECTIVENESS STRATEGIES AND TECHNIQUES

	Item	Low - High (%)					
		1	2	3	4	5	$\bar{X}$
2.1	Understand the cost-effectiveness concept as a developmental strategy for the improvement of vocational programs	3	7	37	37	16	(3.4)
2.2	Understand the cost-effectiveness concept as an analytical technique for evaluating vocational programs	3	3	38	43	13	(3.9)
2.3	Develop strategies to increase effectiveness of vocational programs	17	26	17	23	17	(3.0)
2.4	Develop strategies to increase cost efficiency of vocational programs	17	20	23	30	10	(3.0)
2.5	Develop strategies to improve cost-effectiveness of vocational programs	17	23	24	23	13	(3.1)
2.6	Develop a set of vocational program objectives with specific target goals in measurable terms	10	13	30	27	20	(3.3)
2.7	Assess program output indicators relating to the specified program objectives	7	23	30	27	13	(3.2)
2.8	Determine the direct and indirect program costs per student, per student contact hour, and per completer or graduate in vocational programs	7	13	30	37	13	(3.4)
2.9	Compute program effectiveness measures of vocational programs	7	3	47	30	13	(3.4)
2.10	Compute cost efficiency measures of vocational programs	7	10	40	33	10	(3.3)
2.11	Compute cost-effectiveness and performance ratios of vocational programs	10	10	38	28	14	(3.2)
2.12	Disseminate new strategies and techniques for improving cost-effectiveness of vocational programs	17	10	40	20	13	(3.0)

Group Mean $(\bar{X}) = 3.232$ $\quad S = \sqrt{\frac{x^2}{n}} = .841$

weighted average points of five items are over the middle points, while those of the other five items are below that point. The items at the middle point or above were the relative advantage, compatibility, and trialibility of the developmental strategies, and the compatibility and trialibility of the cost-effectiveness techniques. The items below the middle point were the easiness and observability of the developmental strategies and the relative advantage, easiness, and feasibility of the cost-effectiveness techniques. Most participants thought both the developmental strategies and analytical techniques difficult to understand and use and considered them less feasible.

Responses to the Open Question

To the open question requesting comments on the workshop as a whole and suggestions for future action, most participants made positive comments along with a few criticisms. Thirteen people said, "The workshop was very good." Others added, "The workshop was worthwhile and meaningful"; "Planning and preparation was excellent"; "Paper presentations were very good"; and, "Notebook was helpful."

With regard to small group organization and activities, it was said there were "well organized and coordinated efforts for grouping," and "a nice mix of large and small group activities." It was thought that, "The opportunity to exchange ideas with people from other states was excellent"; "The nominal group approach was very good"; and, "The computational sessions were good to generate controversial issues."

Some people approved the applicability of the cost-effectiveness model: "The cost-effectiveness model is a good management tool"; "The

TABLE III

PARTICIPANTS' PERCEPTION OF THE DEVELOPMENTAL STRATEGIES AND ANALYTICAL TECHNIQUES

	Item	Low - High (%)					
		1	2	3	4	5	$\bar{X}$
3.1	The cost-effectiveness developmental strategies are relatively better ideas than existing practices	10	14	32	34	10	(3.2)
3.2	The developmental strategies are consistent with the current direction of program improvements	11	4	31	46	8	(3.3)
3.3	The developmental strategies are easy to understand and practice	14	25	42	15	4	(2.7)
3.4	The developmental strategies can be experimented with on a limited basis	7	18	32	32	11	(3.2)
3.5	The results from the developmental strategies are visible to others	18	38	40	--	4	(2.3)
3.6	The cost-effectiveness analysis technique is relatively better than other evaluation techniques	26	7	41	26	--	(2.5)
3.7	The cost-effectiveness analysis technique is compatible with existing management skills	--	18	29	39	14	(3.5)
3.8	The cost-effectiveness analysis technique is easy to understand and use	24	34	25	14	3	(2.4)
3.9	The cost-effectiveness analysis can be implemented in a step-by-step process	7	10	42	31	10	(3.3)
3.10	Cost-effectiveness results are feasible and communicable to others	25	27	25	20	3	(2.5)

Group Mean ($\bar{X}$) = 2.906 $\quad S = \sqrt{\frac{x^2}{n}} = .735$

model will be helpful to me as a local administrator"; "A number of the concepts and components can be infused into the model which we are currently developing"; and, "We are looking forward to working with the materials in adopting them to our local, regional and state's needs."

A dozen of the participants mentioned the project staff, group leaders and hotel accommodations: "All staff members did a good job in working with the group and they were very helpful"; "Group leaders were very good -- they were both capable and gracious hosts"; "The hotel accommodations were excellent."

Contrary to these positive responses, there were some critical comments on the content of the topics and the time allotment. Some people complained they had "difficulty understanding the concepts and definitions," and said that, "basic definitions should have been given at the beginning of the workshop." Others observed: "Most of the participants didn't have sufficient background in economics to appreciate the papers"; and, "The cost-effectiveness and performance ratios were difficult to use for comparison."

A few people thought the four-day workshop was too long, and that the workshop days should have been reduced to three or two days. But one person thought there was "too much to do with too little time." Another said there was "not enough time for computing and explaining cost-effectiveness measures." One advised that "more time be allotted to group discussion and to working with the model rather than too much time spent for nominal group meetings."

It was suggested that "the same participants should be invited to return in a year to explore further possibilities expressed at this workshop,"

and more emphasis should be placed, in the future, on the topic, "How to Use an Existing Data Base."

Summary

The national workshop was conducted at the Hyatt Regency Hotel in Indianapolis, Indiana, on March 6-9, 1978. All the selected states' participants attended the workshop and participated in all the general sessions and small group activities.

Three strategy papers and three technique papers were delivered by professionals and experienced local vocational directors. The participants were divided into five small groups. Each group had nominal group meetings to identify priority problems in developmental strategies and practice the analytical techniques developed in the Indiana Cost-Effectiveness Analysis Model. The results of the small group activities were presented at general sessions.

At the final session the participants evaluated the workshop in terms of their satisfaction with the workshop operation, their improvement in the cost-effectiveness strategies and techniques, and their perception of the developmental strategies and the analytical techniques. Their responses in both structured and open questions were strongly positive toward the workshop operation and outcomes.

Chapter III

THE PARTICIPATING STATES' EXEMPLARY PRACTICES AND FOLLOW-UP ACTIVITIES

This chapter summarizes the exemplary practices which were presented by the participating states at the national workshop and reports the states' follow-up activities after the national workshop.

Exemplary Practices

The participating states each presented an exemplary practice, past or present, in conjunction with the workshop topic. A summary of each state's project follows.

State of California: Accountability Model

This is a program for evaluating the effectiveness of vocational education offerings and utilizing the results for planning and evaluation in the state.

To accommodate the objectives, a Vocational Education Accountability Model was devised, composed of three elements: (1) fiscal accountability, (2) student accountability, and (3) program accountability.

Fiscal accountability is concerned with LEA compliance with federal and state mandates governing the expenditures of vocational education funds. Student accountability refers to the determination of the status of students according to a set of criteria compiled and reported in a manner that satisfies federal requirements and state needs. Program accountability is concerned with LEA compliance with VEA, Title V, and Education Code provi-

sions. A review of programs is intended to lead to the development of a plan by the LEA which would include goals, performance, objectives, etc., for each program area. The goals of the review are program improvement to better meet the needs of various populations, and more effective and efficient administration of vocational education programs.

The accountability model is used to annually test twenty percent of institutions offering vocational education programs. The result of the program review will be a report with recommendations aimed at improvement of programs. LEA's will be provided with follow-up contact by state staff and will be encouraged to implement activities in response to the recommendations.

State of Florida: Improving Program Effectiveness

The objectives of the project are: (1) to develop a system for vocational program evaluation which can be implemented at the local level, (2) to insure that the evaluation system will identify program deficiencies and develop recommendations for elimination of the deficiencies, and (3) to provide technical assistance to LEA's through consultative services of the state Department of Education.

The LEA is provided with program review forms which list the standards to be verified by regional consultants in on-site visits. Regional consultants assess the program on the basis of the standards and make arrangements for technical assistance when necessary. The consultant then reports the findings of the program review to appropriate personnel at the local level and at the regional office.

State of Kansas: Improvement of Instruction through Development of Standards for Vocational Program Offerings to Special Students

The objectives of the project are: (1) to improve course offerings and develop standards for vocational programs, (2) to make vocational education available to a majority of the population of the state, and (3) to coordinate the various delivery systems in the state.

The state of Kansas utilizes a variety of delivery systems to bring vocational education to students in the state. Presently, educators set the standards for the delivery of vocational education to students with special needs. As a result of a Special Vocational Needs Workshop, a task force is investigating coordination of existing services and exploring new avenues for service. An effort is being made to involve state staff, teacher educators, area vocational schools, junior colleges, local districts, and private agencies in a coordinated plan for action for the future.

State of Maine: Vocational Program Evaluation Criteria and Procedures

The objectives of the project are: (1) to develop a set of standard criteria and procedures for evaluating vocational programs, and (2) to establish a realistic base and time schedule for program evaluation and approval.

A consulting firm was contracted to assist the Maine Bureau of Vocational Education to develop a set of standard criteria for evaluating vocational programs. The project included testing the resulting instruments. The program evaluation criteria which were developed have received approval in the state of Maine and acceptance by the New England Association of Schools and Colleges.

State of Michigan: Competency-Based Education Articulation of Vocational Education Programs

The objectives of the project are: (1) to develop vertically and horizontally articulated vocational programs, and (2) to develop articulation agreements among the various educational institutions involved.

Pilot studies in articulation are being established at five sites in the state. The sites are made up of consortiums of school districts at the secondary and post-secondary levels. It is anticipated that all schools will eventually be involved in the process. It is hoped that articulation can help vocational education to be cost-effective by reducing the duplication of services.

State of New Jersey: Development of a Cost-Computation Model for Vocational Education Programs

The objectives of the project are: (1) to develop, test, and revise a cost data collection model which will enable local administrators to determine the cost of educating a student in vocational programs, (2) to apply the model to various educational settings, and (3) to determine the cost ratio for educating students in college preparatory, general education, and vocational education programs.

Per pupil costs were computed for four levels of instruction: district level, building level, vocational building level, and program level. Direct and indirect costs vary at the different levels. As a result of the computations, it was found that:

1. The model provides accurate costs per pupil per program which can be calculated at the local school level.

2. Guidelines for calculating the costs can be established.

3. The method of recording and storing data regarding financial expenditures varies among the types of schools.

4. The ratio of cost among college preparatory, general education, and vocational education programs is based upon operating costs.

5. Cost-accounting is a pre-requisite to cost-effectiveness measurement.

State of New Mexico: Cost-Analysis of Vocational Education in Selected School Districts

The project purports to help schools in New Mexico determine the cost of their vocational education programs in relation to the per student cost which is allowed by the public school finance formula.

Participating school districts supplied data to be used in analyzing the cost of educating students in vocational programs. As a result of the analysis, it was found that the student-teacher ratio has the most effect on cost variation. Equipment costs do not have as much effect on cost variation as originally speculated.

The results of the analysis were disseminated to the local schools with guidelines on how to make use of the analysis.

State of Oklahoma: Implementation of Revised Handbook II for Program Accounting in Area Vocational Technical Schools

The objectives of the project are: (1) to provide decision makers at the state and local levels with needed information for cost-effectiveness analysis of vocational education programs, and (2) to train individuals in program accounting.

After identifying pilot schools to test the project, personnel were invited to seminars to be introduced to procedures for classifying costs and coding them. Seminar participants were trained in utilizing a computer serv-

ice that is available in the state. In addition, they were provided with a manual that describes the complete accounting procedures.

The result of the project was adoption of the new technique in the Area Vocational Technical Schools in the state. While comprehensive high schools have been hesitant to adopt program accounting, AVTS administrators have shown an interest in the cost and effectiveness measures which are to be used as a basis for decision making.

State of West Virginia: Program Cost Accounting

The project attempts to develop program cost accounting for vocational education programs in conjunction with a statewide program accounting system. Through the system, local vocational administrators can monitor better and identify the cost of their programs. The system also assists in program planning by analyzing historical data on program costs.

State of Wisconsin: Evaluation of Post-Secondary Vocational Programs

The objectives of the project are: (1) to evaluate post-secondary vocational programs on a five year cycle, and (2) to assist local districts in meeting the needs of students, business, and industry.

A formal state evaluation team makes two-day on-site visits to local post-secondary institutions. Evaluation is based on a detailed check list that includes output indicators, curriculum review, administrative review, instructional processes, and learning environment. After evaluation, a report of findings is disseminated to local administrators and to the state. The report includes recommendations and/or suggestions for program improvement.

Follow-Up Activities

After the national workshop, the participating states initiated follow-up activities to improve the cost-effectiveness of their vocational programs. Each state workshop or alternate activity is summarized below.

State of California

The state's follow-up activities include: (1) planning sessions to develop a modified cost-effectiveness technique, (2) field testing of the technique, and (3) statewide workshops for local vocational administrators.

Objectives of the Activities. The objectives of the follow-up activities were to: (1) explore emerging concepts of cost-effectiveness analysis of vocational education programs, (2) develop a methodology for measuring the cost-effectiveness of vocational programs and services for inclusion in the California Occupational Information System (COIS), (3) present cost-effectiveness analysis to local administrators as a tool for planning and evaluating vocational education programs and services, and (4) implement cost-effectiveness studies in a limited number of vocational institutions on an experimental basis.

Procedures for the Activities. In April and May of 1978, California's three participants in the national workshop and members of the California Occupational Information System (COIS) convened for the purpose of determining how a cost-effectiveness procedure could be implemented in the state's vocational system. They determined that: (1) cost-effectiveness analysis could be utilized as an aid to decision-making by local administrators, (2) the results of cost-effectiveness analyses could not be used for comparing programs and/or services unless the analyses were based on common goals and

objectives, and (3) cost-effectiveness analysis could be useful for determining the effectiveness of vocational programs and services on a longitudinal basis.

The primary draft of the "Vocational Education Program Operations Analysis" manual and worksheets were developed and reviewed by the participants and the national project staff. A person from the community college sector reviewed and revised the manual and worksheet for community college use. In July, the manual and worksheet were field-tested within a community college district and a secondary district. The final forms of the documents were made available to local administrators at fall workshops.

State Workshops. The three national workshop participants initiated a state workshop which was held at the San Bernardino County Office on September 21-22, 1978. Twenty-three vocational administrators and business accountants from two regional occupational programs, one community college, four secondary districts, and state department and regional offices participated in the workshop. The three national workshop participants presented what they had learned from the national workshop on improving the cost-effectiveness of vocational programs as well as the need for an information system to improve vocational program operation. The participants practiced cost-effectiveness measurement using the worksheets. The national project director assisted them in computing and interpreting the measures. Additional workshops were scheduled in December of 1978, and January of 1979.

Future Directions. The state of California has a system for determining the cost of educating vocational students which is set forth in the California Cost Accounting Manual (1978). The system has been implemented in many of the institutions in the state. The State Department of Education

has determined that cost-effectiveness analysis can be a valuable tool for decision-making for local administrators. It has developed vocational education program operations analysis manuals for use by local administrators on a voluntary basis. When local administrators decide to implement cost-effectiveness studies in local school districts, state personnel will be available to provide technical assistance.

State of Florida

In an effort to introduce cost-effectiveness concepts throughout the state, a state-level personnel workshop was scheduled for the third week in October of 1978, but was later cancelled. The State Department of Education has funded a cost-effectiveness project through the University of Florida. As of this date, there are no plans for a state activity to follow-up the national workshop; the results of their own efforts on the cost-effectiveness project are due momentarily.

State of Kansas

The original plan attempted to: (1) develop a statewide cost-effectiveness program, (2) prepare local vocational administrators to implement local cost-effectiveness programs, (3) establish state-supported regional workshops for vocational educators, (4) monitor regional workshops, (5) evaluate the cost-effectiveness programs and provide the national project director with a summary review of the cost-effectiveness programs. Some of the workshops were to be held during the summer, 1978.

However, changes in the state organizational structure for vocational education delayed the implementation of the original plan. At the moment their schedule for future activities is uncertain.

State of Maine

The three team members arranged a conference to discuss improving cost-effectiveness of vocational programs. The conference was held at the S.M.V.T.I. campus on November 14, 1978. Nine secondary and post-secondary vocational administrators attended the conference.

At the meeting, the national project director presented the total cost-effectiveness analysis model with emphasis on the computation of cost-effectiveness and cost-benefit measures. After the presentation, the participants discussed the application of the model to the development of a statewide planning and accountability reporting system.

State of Michigan

The state of Michigan made a tentative plan for a two-day workshop as a follow-up activity. The workshop was to: (1) describe what is meant by the term "cost-effectiveness", (2) establish cost-effectiveness criteria for vocational education programs, (3) review various strategies for improving the cost-effectiveness of vocational programs, and (4) provide assistance in developing a plan for further dissemination of the strategies and techniques for improving the cost-effectiveness of vocational programs. The workshop was scheduled to be held in May of 1978.

However, they decided to wait until January of 1979 and proposed a workshop for both secondary and post-secondary vocational administrators. The state director assured us that their state's national workshop participants, even without technical assistance from the national project staff, could conduct the workshop using the materials delivered at the national workshop.

State of New Jersey

The three team members who participated in the national workshop conducted a statewide workshop on Cost-Effectiveness Analysis Techniques for Vocational Education at the New Jersey Occupational Resource Center in Edison, New Jersey on May 12, 1978, from 9:00 a.m. to 4:00 p.m.

Purpose of the Workshop. The purpose of the workshop was to present: (1) emerging concepts of cost-effectiveness analysis, (2) the do's and don'ts in the application of the emerging concepts, and (3) a model for calculating per-pupil cost for secondary vocational programs.

Procedures for the Workshop. Among thirty participants, school superintendents and vocational directors comprised the vast majority of those in attendance. The state director spoke briefly to the group concerning the state's commitment to the cost-effectiveness approach. Each of the three team members presented: (1) a brief description of models and theories related to cost-effectiveness analysis, (2) the merits and deficiencies of the Indiana Cost-Effectiveness Analysis Model, and (3) a model for calculating per-pupil cost for secondary vocational programs.

Future Directions. New Jersey is engaged in determining how effectiveness and efficiency will be measured and reported in the state's school systems. Once the method for both analyzing and reporting cost data is determined, the state will utilize just one system. The participants in the workshop have provided inputs into the process of that direction.

State of New Mexico

The state of New Mexico conducted two conferences for vocational administrators, legislators, school board association members, and state agency personnel on April 3-4, and April 13, 1978.

Purpose of the Conferences. The purpose of the conferences was to: (1) present strategies and techniques learned at the national workshop, (2) present New Mexico's model for determining vocational program costs, and (3) discuss means of determining cost-effectiveness and benefits of vocational programs.

Procedures for the Conference. After a keynote address, the participants were assigned to discussion groups to discuss problems in establishing a cost analysis system. The New Mexico cost analysis process was presented and the small groups were allowed to work through the cost analysis process. Discussion groups were allowed to provide feedback on the process. Then the Indiana Cost-Effectiveness Analysis Model was presented, and the participants discussed means of determining the cost-effectiveness of vocational programs.

Future Directions. New Mexico is involved in the process of analyzing costs of vocational programs on a unit cost per student and per student contact hour basis. The State Department of Education has a plan to refine the cost analysis model in several areas such as: (1) the number of periods -- actual periods taught and/or actual periods available, (2) some revision of the teachers' aides and substitute teacher factors, (3) addition of instructional travel costs when available, (4) calculation of cost differences when using average teacher salaries in programs within the district, or actual teacher salaries in programs within the district, and (5) calculation of costs using both proposed budget and actual expenditures for the district. Developmental strategies are being explored in New Mexico for implementing cost-effectiveness techniques in the vocational education system.

State of Oklahoma

The Oklahoma State Department of Education arranged workshops on cost-effectiveness analysis at three area vocational school sites on April 6, 11, and 13, 1978. School administrators, business managers, and financial secretaries of the twenty-one area vocational schools attended one or another of the workshops.

Purpose of the Workshops. The purpose of the workshops was to: (1) present strategies and techniques learned at the national workshop, and methods for determining effective and efficient programs, (2) explain Oklahoma's procedures for analyzing VPA costs, and (3) provide an opportunity for discussion of cost analysis.

Procedures for the Workshops. One of the team members presented a summary of the Indiana Cost-Effectiveness Analysis Model, and the conceptual framework and analytical techniques were discussed among the groups. By the means of training exercises, the participants were encouraged to help develop methods for determining effective and efficient programs.

Throughout the workshop, such problems were identified as: (1) selection of objectives and goals, (2) ability to measure goal attainment with weighting points, (3) depreciation of equipment as a cost factor, (4) spreading capital outlay over programs, (5) methods of prorating costs, and (6) utility of program effectiveness, cost efficiency, and performance measures. Procedures for reporting program costs of area vocational schools were explained in terms of common definitions, methods for prorating indirect costs, and direct costs per program.

Future Directions. Oklahoma is in the process of analyzing costs for programs in the twenty-one area vocational schools. In FY 1978-79 it will be

necessary to add the costs of serving the handicapped and the disadvantaged within the mainstream of instruction. The state intends to expand the cost analysis process to its comprehensive high schools. Progress is being made in the use of cost-effectiveness measures for decision-making.

Puerto Rico

The Puerto Rico Department of Education arranged a workshop on improving cost-effectiveness of vocational programs on September 12, 1978. A total of forty-two vocational administrators attended the workshop.

Purpose of the Workshop. The workshop was designed to train the participants in: (1) using cost-effectiveness techniques, (2) developing vocational program objectives in measurable terms, (3) determining program costs on a per-student basis, and (4) computing cost-effectiveness measures.

Procedures for the Workshop. The commonwealth director for vocational education spoke on the nature of the workshop in conjunction with the national workshop and introduced the national project director to the audience.

In the morning session, the national project director presented the Indiana Cost-Effectiveness Analysis Model, with emphasis on the computation of the cost-effectiveness measures. In the afternoon session, the participants worked on the specification of target goals, analysis of program costs, and computation of cost-effectiveness measures. Then they discussed the application of cost-effectiveness analysis to planning and evaluating vocational programs.

State of West Virginia

The State Department of Education conducted a workshop on cost-effectiveness analysis in conjunction with the 1978 Annual Local Directors'

Conference held at the National Mine Health and Safety Academy in Berkley, West Virginia on October 4-6, 1978.

At the workshop, the three team members who participated in the national workshop reported on the national workshop activities and presented the Indiana Cost-Effectiveness Analysis Model and step-by-step procedures for using the model. After the presentation, the participants were divided into four small groups, and they worked on determination of program objectives, analysis of program costs, and computation of cost-effectiveness measures. The resulting measures were interpreted and discussed at the general session.

State of Wisconsin

The Wisconsin State Board of Vocational, Technical and Adult Education conducted a statewide workshop on cost-effectiveness analysis at the Sheraton Hotel in Madison on June 20-21, 1978. There were thirty post-secondary administrators, financial managers, R & D coordinators from the sixteen districts of the Wisconsin V.T.A.E. system, and five secondary administrators.

Purpose of the Workshop. The purpose of the workshop was to assist vocational administrators in improving management skills by increasing their understanding of a cost-effectiveness analysis model and the application of step-by-step procedures and analytical techniques.

Procedures for the Workshop. At the initial session of the workshop, the national project director presented the Indiana Model and contrasted it to existing management systems. One of the team members explained how the activities of the workshop would enable the participants to calculate cost-effectiveness measures.

In the small group sessions that followed, the participants determined objectives for hypothetical programs, analyzed program costs, and computed program effectiveness, cost efficiency, and performance measures. At general sessions after group workshops, each group presented its results and discussed the implications of cost-effectiveness analysis of vocational programs.

At the banquet on June 20, Dr. George Copa, a guest speaker, presented some additional concepts on how cost-effectiveness measures can be utilized for decision-making.

Future Directions. The post-secondary vocational and technical institutes are concentrating on developing goals in the planning process. Currently, the State Board evaluates districts' departments on five-year cycles. Some of the institutes have conducted research on cost-benefit analysis of their vocational programs. After the workshop, local administrators will decide whether to adopt the Indiana Model's concepts and techniques in their planning and reporting processes.

Summary

Ten participating states presented exemplary practices at the initial session of the national workshop. There were five program effectiveness improvement and evaluation practices, four cost analysis or accounting projects, and one accountability program.

After the national workshop, eight states of the eleven participating states conducted a statewide workshop or alternate follow-up activity with technical assistance from the national project staff. Through the state workshops, the cost-effectiveness concepts and analytical techniques as

developed in the Indiana Cost-Effectiveness Analysis Model have been demonstrated to approximately three hundred vocational administrators at both the state and local levels. The three remaining states will conduct follow-up activities in the near future.

Chapter IV

CONCLUSIONS AND RECOMMENDATIONS

This final chapter draws conclusions from the national workshop and follow-up activities and makes some recommendations for future activities.

Conclusions

This report describes the national workshop on improving cost-effectiveness of vocational programs and the participating states' follow-up activities. The national workshop was designed to train vocational administrators in developmental strategies and analytical techniques for improving the cost-effectiveness of vocational programs so that they can function as change agents in disseminating the strategies and techniques throughout the nation.

Eleven states were selected to attend the workshop, and three team members from each state were invited. A total of forty vocational educators and administrators at both the state and local levels attended the four-day workshop which was held in Indianapolis, Indiana, on March 6-9, 1978.

At the opening session, the team leader of each of the participating states presented a state exemplary practice to exchange some ideas among the participants. During the workshop general sessions, three strategy papers and three technique papers were delivered. The participants were divided into five groups and the group members identified some priority problems in developmental strategies through nominal group meetings and practiced the cost-effectiveness techniques in small group workshops. The results of the

group activities were presented at general sessions and discussed among the groups. At the final session, the participants evaluated the process and outcomes of the workshop.

After the national workshop, the participating states were required to conduct follow-up activities. Eight states out of the eleven participating states have conducted statewide workshops within the period of this project, and the three remaining states are expected to have their state meetings in the near future.

The national workshop and follow-up activities resulted in the following conclusions:

1. Through the workshop, cost-effectiveness developmental strategies were explored in improving program effectiveness, increasing cost efficiency, and improving cost-effectiveness of vocational programs. A majority of the participants felt they had improved their understanding of the developmental strategies, and thought those strategies relatively better than existing practices, consistent with the current directions in vocational education, and being experimentable on a limited basis.

2. The nominal group technique was applied to identify priority problems in the developmental strategies. The most important problems were found to be conceptual problems, and shortage of reliable data.

3. The Indiana Cost-Effectiveness Analysis Model and relevant documents were delivered as exemplary techniques to the participants. Through the small group workshops, most participants increased their awareness of the cost-effectiveness techniques. They perceived the techniques to be compatible with existing management skills and to be implementable in a step-by-step process. They didn't think the techniques easy or feasible.

4. Participants were generally most impressed with the planning and implementation of the workshop. Some people suggested that the same participants should be invited to return in a year to explore further the ideas expressed at the workshop, and more emphasis, they felt, should be placed on the use of an existing data base.

5. The presentation of the exemplary practices by the participating states was helpful in sharing some information, or ideas on their relevant practice, with other states' participants.

6. Through the state workshops, approximately three hundred vocational administrators at both the state and local levels were exposed to the cost-effectiveness concepts and techniques. Many participants in the state workshops expressed interest in knowing the emerging concepts and techniques for improving cost-effectiveness of vocational programs.

7. Some states attempted to combine the cost-effectiveness techniques with existing cost accounting and information systems. The techniques can be incorporated into the PPB, MBO, and accountability systems.

Recommendations

This training project was issued as one of the eighteen nationally significant programs. The initial effort for improving cost-effectiveness of vocational education programs should be expanded in all states, but cooperative research efforts will be necessary to improve the cost-effectiveness strategies and techniques for vocational programs. From this point of view, the following recommendations are made for future activities:

1. Cooperative efforts between theoreticians and practitioners should concentrate on specifying developmental strategies and their implementation.

2. The priority problems in developmental strategies which were identified at the workshop should be considered as research grant programs. Additional research to solve the problems will speed implementation of the developmental strategies.

3. To facilitate the application of the cost-effectiveness techniques, further consideration should be given to the development of a package for cost-effectiveness analysis including simulation data and detailed guidelines. Also, a feasibility study is needed to determine cost-effectiveness measures for evaluating and planning vocational programs.

4. The opportunity for the training workshop should be available to states which did not participate in the initial workshop. Repeated workshops based on accumulated data and experience will increase the utility of the cost-effectiveness strategies and techniques in improving vocational programs.

5. Continuous technical assistance and financial support should be available for states that attempt to improve the cost-effectiveness of their vocational programs.

6. The initial effort of the federal government is appreciated. Additional efforts are required for promoting the cost-effectiveness strategies and techniques, for expanding training opportunities, and for installing the cost-effectiveness approach as a management system for improving vocational education programs.

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APPENDIX A:

NATIONAL WORKSHOP AGENDA

APPENDIX A

NATIONAL WORKSHOP AGENDA

DEVELOPMENTAL STRATEGIES AND ANALYTICAL TECHNIQUES
FOR IMPROVING COST-EFFECTIVENESS OF VOCATIONAL PROGRAMS

Hyatt Regency Hotel, Indianapolis, Indiana
March 6-9, 1978

Monday, March 6, 1978

2:00 - 2:30 p.m.	Registration
2:30 - 3:00 p.m.	Welcome and Introduction: Thomas R. White
3:00 - 6:00 p.m.	State Exemplary Practices Presenters: Team Leaders Moderator: Allan Wiggle
7:00 - 9:00 p.m.	Banquet Program

Tuesday, March 7, 1978

8:00 - 8:30 a.m.	Orientation to the Workshop Presenter: Jin Eun Kim
8:30 - 9:15 a.m.	*Improving Program Effectiveness* Presenter: Lois-ellin Datta Moderator: Mary Janet Penrod
9:15 - 9:30 a.m.	Break
9:30 - 11:00 a.m.	Nominal Group Discussion
11:00 - 12:00 a.m.	Group Solution Moderator: Vicki Neaves
12:00 - 1:30 p.m.	Lunch
1:30 - 2:15 p.m.	*Determining Program Objectives and Outputs* Presenter: Roderick A. McKinney Moderator: Beverly Hankenhoff
2:15 - 3:30 p.m.	Group Workshop: Target Goal Determination
3:30 - 3:45 p.m.	Break
3:45 - 4:30 p.m.	*Increasing Cost Efficiency* Presenter: James A. Pershing Moderator: Paula Carter
4:30 - 6:00 p.m.	Nominal Group Discussion
7:00 -	Dinner (Planned)

APPENDIX A, continued

Wednesday, March 8, 1978

8:30 - 9:30 a.m.	Group Solution Moderator: Jerry Havill
9:30 - 9:45 a.m.	Break
9:45 - 10:30 a.m.	*Analyzing Program Costs* Presenter: Don E. Pennington Moderator: Thomas G. Garrison
10:30 - 12:00 a.m.	Group Workshop: Cost Analysis
12:00 - 2:00 p.m.	Lunch
2:00 - 2:45 p.m.	*Improving Cost-Effectiveness of Vocational Programs* Presenter: George Copa Moderator: Don K. Gentry
2:45 - 3:00 p.m.	Break
3:00 - 4:30 p.m.	Nominal Group Discussion
4:30 - 5:30 p.m.	Group Solution Moderator: Ina Moseley
5:30 -	Open

**Thursday, March 9, 1978*

8:30 - 9:15 a.m.	*Computing Cost-Effectiveness Measures of Vocational Programs* Presenter: Jin Eun Kim Moderator: Phillip Mann
9:15 - 9:30 a.m.	Break
9:30 - 11:30 a.m.	Group Workshop: Cost-Effectiveness Measurement
11:30 - 1:30 p.m.	Lunch
1:30 - 2:45 p.m.	Group Presentation and Comments Moderator: Phillip Mann
2:45 - 3:00 p.m.	Break
3:00 - 4:00 p.m.	Summary and Evaluation
4:00 - 5:00 p.m.	Arrangements for State Activities
5:00 -	Adjournment

*If it is necessary, you may stay overnight at the hotel. Lodging for the night of March 9 will be reimbursed by the project.

APPENDIX B:

APPLICATION PACKAGE FOR THE NATIONAL WORKSHOP

APPENDIX B

INDIANA UNIVERSITY
School of Education
BLOOMINGTON, INDIANA 47401

DEPARTMENT OF VOCATIONAL EDUCATION
213 SOUTH JORDAN AVENUE

TEL. NO. 812—337-8104
337-8141

October 4, 1977

Dear Colleague:

We would like to have your attention for a moment! Are you having problems dealing with questions from your legislature, taxpayers, or parents, such as:

(1) How well are the objectives of your vocational programs being achieved?
(2) How much do your programs cost?
(3) What evidence is available to indicate the cost-effectiveness of your programs?

Are you pressed to show or improve the degrees of program effectiveness, cost efficiency, and management performance in vocational education?

Do you need exemplary practices, ideas, techniques, and possible solutions for your problems? If your answer is YES, please look at the enclosed document; if your answer is no, then disregard it.

Here is an opportunity for you to think about some solutions to problems which are based on practical approaches, without any cost to you. This opportunity is a national priority training program entitled DEVELOPMENTAL STRATEGIES AND ANALYTICAL TECHNIQUES FOR IMPROVING THE COST-EFFECTIVENESS OF VOCATIONAL PROGRAMS.

This program will provide an invitational, EPDA-funded workshop for 30 representative personnel from ten selected states in the U.S.O.E. regions throughout the nation. State selection will be based on the state's application to participate in the program.

Please find relevant information and application forms enclosed for your consideration. The application should be postmarked no later than November 15, 1977. If you need further information, do not hesitate to contact Jin Kim or Jerry Havill at (812) 337-8104 or 337-2513.

Sincerely,

Jin Eun Kim

Jin Eun Kim, Ph.D.
Project Director
Cost-Effectiveness Studies in Vocational Education

JEK:dld

Enclosures

APPENDIX B, continued

STATE OF INDIANA
State Board of
Vocational and Technical Education
INDIANAPOLIS 46204

401 Illinois Building
17 West Market Street
Indianapolis, Indiana 46204
Phone (317) 633-7873

October 11, 1977

Dear Colleague:

I am pleased to remind you of the National Priority Training Program #1, which was announced by Indiana University.

Improving cost-effectiveness of vocational programs is our accountability to legislature, taxpayers, parents, and vocational students. Even though our efforts are directed toward that purpose, we need "how-knowledge" to improve program effectiveness, cost efficiency, and management performance in vocational education as well as techniques for analyzing cost-effectiveness of vocational programs.

In an effort to meet these needs, Dr. Jin Eun Kim and his associates developed a cost-effectiveness analysis model, data forms, and mathematical formulas for vocational programs. These products have been recognized to be an innovative and practical approach to improving the cost-effectiveness of vocational programs. The usefulness of the products was proven throughout a statewide workshop in Indiana.

As announced by Indiana University, there is an opportunity for us to share the Indiana cost-effectiveness model and related products with other states. We believe this EPDA funded program will assist in achieving one of our common goals, "SQUEEZING THE DOLLAR FOR EFFECTIVE VOCATIONAL PROGRAMS", to satisfy our concerned people.

Based on such a belief, our State Board and the U.S. Office of Education strongly support this program, and we encourage you to participate in the National Priority Training Program #1: DEVELOPMENTAL STRATEGIES AND ANALYTICAL TECHNIQUES FOR IMPROVING COST-EFFECTIVENESS OF VOCATIONAL PROGRAMS. Further information will be available from Dr. Jin Eun Kim, Department of Vocational Education, Indiana University, 223 S. Jordan Avenue, Bloomington, Indiana 47401 (phone: 812-337-8104).

Sincerely,

Don K. Gentry

DON K. GENTRY
Executive Officer/State Director
of Vocational Education

DKG/JEK:djd

APPENDIX B, continued

ANNOUNCEMENT FOR THE NATIONAL PRIORITY TRAINING PROGRAM #1:
IMPROVING COST-EFFECTIVENESS OF VOCATIONAL PROGRAMS

Indiana University will conduct a national training workshop for improving cost-effectiveness of vocational programs with the support of the State Board of Vocational and Technical Education. This announcement is to both inform and encourage states to apply for participation in this program which is funded by the U.S. Office of Education under the authority of the EPDA, Part F, Section 553.

OBJECTIVES: To assist the participants in:

1. Increasing their understanding of the cost-effectiveness concept as a developmental strategy as well as an anlytical technique for the improvement of vocational programs.
2. Exploring the strategies to improve cost-effectiveness of vocational programs.
3. Developing a set of vocational program objectives with specific target goals in measurable terms.
4. Assessing program output indicators relating to the specified program objectives.
5. Determining the direct and indirect program costs per student enrolled in vocational programs, per student contact hour, and per completer or graduate.
6. Computing program effectiveness, cost efficiency, and management performance of vocational programs.
7. Functioning as a change-agent by diffusing new strategies and techniques for improving cost-effectiveness of vocational programs.

TOPICS AND ACTIVITIES:

1. Improving Program Effectiveness
2. Increasing Cost Efficiency
3. Improving Management Performance in Vocational Programs

A series of papers on each topic will be presented and the nominal group approach will be adopted to identify practical strategies.

4. Determining Program Objectives and Outputs
5. Analyzing Program Costs
6. Computing Cost-Effectiveness Measures of Vocational Programs

A series of exemplary techniques as related to the topics will be provided and the participants will have a group workshop on each of the topics using Indiana's model and simulation data.

PARTICIPANTS: Thirty representative personnel of ten selected states from regions throughout the nation.

REIMBURSEMENT OF EXPENSES: The participant's expenses for transportation, lodging and per diem will be reimbursed per University regulations.

DATES AND SITE: March 6th-9th, 1978; Hyatt Regency Hotel, Indianapolis, Indiana

APPLICATION DUE DATE: All applications should be postmarked no later than November 15, 1977.

APPENDIX B, continued

A NATIONAL PRIORITY TRAINING PROGRAM ON
DEVELOPMENTAL STRATEGIES AND ANALYTICAL TECHNIQUES FOR
IMPROVING COST-EFFECTIVENESS OF VOCATIONAL PROGRAMS

CRITERIA FOR STATE AND PARTICIPANT SELECTION

1. The state must be willing to conduct a statewide workshop, or alternate activity which would in the state's judgment have statewide impact, on improving cost-effectiveness of vocational programs after participating in the National Workshop, (March 6th-9th, 1978).

2. The state should have an exemplary practice to improve program effectiveness, cost efficiency and/or cost-effectiveness which will be shared with other participants at the National Workshop.

3. The team participants should have some background in program evaluation, planning-programming-budgeting system (PPBS), cost analysis, or cost-effectiveness analysis with respect to vocational programs.

The following considerations are suggested in recommending state team participants.

a. The state director will recommend three participants, as a team, to represent the State.

b. The state team should have a local vocational administrator(s) as well as state vocational agency personnel.

c. The members of the state team should be responsible for coordinating the statewide activity.

d. The individuals recommended must be willing to play active roles in both the National Workshop and State Workshop or activity alternate.

e. The National Workshop's emphasis level will be secondary, however, many of the materials and basic concepts are adaptable to other levels.

f. The project is committed to avoid sex bias and sex role sterotyping. Women and other minority leaders are encouraged to participate in the training program.

APPENDIX B, continued

APPLICATION FOR PARTICIPATION

IN

A NATIONAL PRIORITY TRAINING PROGRAM

ON

DEVELOPMENTAL STRATEGIES AND ANALYTICAL
TECHNIQUES FOR IMPROVING COST-EFFECTIVENESS
OF VOCATIONAL PROGRAMS

STATE DIRECTOR'S NAME: _____

ADDRESS: _____

PHONE: ( ) _____

STATE TEAM RECOMMENDED:

	NAME	POSITION
1.	_____	_____
2.	_____	_____
3.	_____	_____

All applications must be postmarked no later than November 15, 1977 to receive full consideration.

(1)

APPENDIX B, continued

If selected as a state participant in the National Priority Workshop on Developmental Strategies and Evaluation Techniques for Improving Cost-Effectiveness of Vocational Programs, the State of _____ understands that it is expected to conduct a statewide workshop or alternate activity for the purpose of disseminating information and training vocational administrators in cost-effectiveness strategies and techniques with technical assistance to be provided by the project staff.

SIGNATURE: _____

STATE DIRECTOR

DATE: _____

ADDITIONAL INFORMATION PERTAINING TO STATEWIDE WORKSHOP OR ALTERNATE ACTIVITY

1. The state should reserve a tentative date for the statewide workshop or alternate activity before attending the National Workshop which is scheduled for March 6th-9th, 1978.
2. The dates of the workshop or alternate activity should be scheduled after the National Workshop (March 6th-9th, 1978) preferably no later than June 30, 1978. Technical assistance at project cost ends June 30th.
3. State workshop or alternate activity dates will need to be arranged to avoid overlap in order to provide requested assistance.
4. The state workshop or alternate activity will be coordinated by the participating team with technical assistance, which might include planning, topic presentation or providing materials, by the project staff.
5. Upon completion of the state workshop or alternate activity a report will be made in accordance with the format requested.

APPENDIX B, continued

A TENTATIVE PLAN: *

STATEWIDE WORKSHOP OR ALTERNATE ACTIVITY
FOR
IMPROVING COST-EFFECTIVENESS OF VOCATIONAL PROGRAMS

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1. Please provide a description of how your state would organize and conduct a statewide workshop or alternate activity on improving cost-effectiveness of vocational programs utilizing the following framework.

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a. Background Information: Background information may include current situations, problems to be solved, or need for a statewide workshop or activity.

b. Objectives: Objectives may be stated as participants' behavioral objectives or specific workshop program or activity objectives, or both.

c. Program and Activities: State briefly how the workshop or activity will be structured and what activities will be included.

d. Expected Benefits: Benefits should be specified in terms of participant outcomes. If there is more than one outcome or benefit expected, list them in order of importance.

e. Number of Participants: Please indicate the number of expected individuals that will be participating in the workshop or activity.

f. Workshop Schedule: Please state the proposed time schedule for the state workshop or activity.

* 1. It is understood that change, possibly major in nature, can be made in the tentative plan after attending the National Workshop.

2. Please limit your response to no more than two (2) double spaced typed written pages.

(3)

APPENDIX B, continued

AN EXEMPLARY PRACTICE: *

IMPROVING PROGRAM EFFECTIVENESS, COST EFFICIENCY,
OR COST-EFFECTIVENESS OF VOCATIONAL PROGRAMS

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2. In your state, what exemplary programs have been done or are being conducted for vocational program development and evaluation? Please outline your state's exemplary practice as related to improving program effectiveness, cost efficiency, or cost-effectiveness of vocational programs.

---

a. Background Information: May include state research projects, related reports or information.

b. Objectives or Problems: State the objectives of the practice or the problems being dealt with as a result of the practice.

c. Approaches or Procedures: State the approaches or procedures utilized in implementing the practice.

d. Findings or Solutions: State the findings or solutions that resulted from evaluating the practice in your given situation.

e. Recommendations: What recommendations would you have for other states wishing to implement a similar practice?

* Please limit your response to no more than five (5) double spaced typed written pages.

APPENDIX C:

PARTICIPATING STATES AND TEAM MEMBERS

APPENDIX C

PARTICIPATING STATES AND TEAM MEMBERS

State of California

*Mr. John Van Zant
Director of California Occupational Information System
State Department of Education/Ventura County Office
Ventura, California

Mr. Roland M. Boldt
Administrator, Vocational Field Operations
State Department of Education
Sacramento, California

Dr. Arthur W. Smith, Jr.
Director of Vocational Education
San Bernardino County Schools
San Bernardino, California

State of Florida

*Dr. Mark L. Headrick
Evaluation Consultant
State Department of Education
Tallahassee, Florida

Mr. James E. Williams
Educational Specialist
State Department of Education
Tallahassee, Florida

Mrs. Clarice F. Biggins
Director of Vocational Education
Volusia County School Board
Daytona Beach, Florida

State of Kansas

*Dr. Dale E. Brooks
Director
Area Vocational-Technical School
Newton, Kansas

APPENDIX C, continued

Dr. William E. Sparkman
Assistant Professor
Kansas State University
Manhattan, Kansas

Dr. Norman W. Park
VEPD Coordinator
State Department of Education
Topeka, Kansas

State of Maine

*Mr. Whitney B. Newcomb
Director of Program Operations
State Department of Education
Augusta, Maine

Mr. Richard M. Knight
Coordinator, Post-Secondary Vocational and Technical Institutions
State Department of Education
Augusta, Maine

Mr. Donald V. Manchildon
Coordinator, Secondary Vocational Center
State Department of Education
Augusta, Maine

State of Michigan

*Dr. Edward D. Cory
Vocational Education Consultant
State Department of Education
Lansing, Michigan

Dr. Andrew Mozzara
Dean, Career Development Education
Henry Ford Community College
Dearborn, Michigan

Mr. James C. Howard
Consultant
State Department of Education
Lansing, Michigan

APPENDIX C, continued

State of New Jersey

*Dr. Charles R. Doty
Associate Professor, Technical Education
Rutgers University
New Brunswick, New Jersey

Dr. Henry E. Tornell
Director of Post-secondary and Industrial Education
State Department of Education
Trenton, New Jersey

Dr. Po-Yen Koo
Director, Vocational Planning and Data Analysis
State Department of Education
Trenton, New Jersey

State of New Mexico

*Dr. Lloyd G. Cooper
Professor of Educational Management and Development
New Mexico State University
Las Cruces, New Mexico

Mr. Bill Jackson
Assistant State Director
Department of Vocational-Technical Education
Santa Fe, New Mexico

Mr. Bill Castorena
Principal
Alamogordo Senior High School
Alamogordo, New Mexico

Ms. Carol L. Robertson
Graduate Student
New Mexico State University
Las Cruces, New Mexico

State of New York

*Mr. Dale M. Post
Director, Occupational Education Supervision
State Department of Education
New York, New York

APPENDIX C, continued

Dr. Donna M. Santa
Director, Occupational Education
BOCES
Valhala, New York

Mr. Edgar J. Hollwedel
Director, Career, Occupational and Continuing Education
Rochester City School
Rochester, New York

State of Oklahoma

*Mr. Dwight Lee Stoddard
Auditor
State Department of Vocational-Technical Education
Stillwater, Oklahoma

Mr. James A. Hall
Director of Finance and Purchasing
Indian Meridian Vocational-Technical School
Stillwater, Oklahoma

Mr. William Bradley Aneshansley
Field Auditor
State Department of Vocational-Technical Education
Stillwater, Oklahoma

Puerto Rico

Mrs. Virginia Antongiorgi
Researcher
Department of Education
Hato Ray, Puerto Rico

State of West Virginia

*Mr. James E. Slamick
State Supervisor, Fiscal Control
State Board of Education
Charleston, West Virginia

APPENDIX C, continued

Mr. Robert L. Quigley
Vocational Director
Ohio County Schools
Wheeling, West Virginia

Mr. James D. Robinson
Vocational Director
Raleigh County Board of Education
Beckley, West Virginia

State of Wisconsin

*Mr. Roland J. Kroqstad
RCU Director
State Board of Vocational-Technical
and Adult Education
Madison, Wisconsin

Dr. Mehar Arora
Professor, Business and Industrial Management
University of Wisconsin - Stout
Menomonie, Wisconsin

Mr. Arthur A. Marson
Research Specialist
Moraine Park Technical Institute
Fond Du Lac, Wisconsin

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*Indicates team leaders who presented states' exemplary practices at the national workshop.

APPENDIX D:

NATIONAL WORKSHOP EVALUATION FORM

APPENDIX D

A
NATIONAL PRIORITY TRAINING WORKSHOP
ON
DEVELOPMENTAL STRATEGIES AND ANALYTICAL TECHNIQUES
FOR
IMPROVING COST-EFFECTIVENESS
OF
VOCATIONAL PROGRAMS

Hyatt Regency Hotel, Indianapolis, Indiana

March 6-9, 1978

WORKSHOP EVALUATION

COST-EFFECTIVENESS STUDIES IN VOCATIONAL EDUCATION

SCHOOL OF EDUCATION, INDIANA UNIVERSITY

BLOOMINGTON, INDIANA

APPENDIX D, continued

1. Please circle the number in the righthand low-high scale which best indicates the degree of your satisfaction with the following selected aspects of the paper presentations, group discussion or workshop, and the total workshop implementation.

		SATISFACTION				
	With regard to paper presentations:	Low				High
1.1	Ideas or issues presented	1	2	3	4	5
1.2	Opportunity for questions	1	2	3	4	5
1.3	Relevance of content	1	2	3	4	5
1.4	Effectiveness of delivery	1	2	3	4	5
	With regard to group discussion or workshop:					
1.5	Ideas or issues discussed	1	2	3	4	5
1.6	Opportunity for participation	1	2	3	4	5
1.7	Relevance of content	1	2	3	4	5
1.8	Amount of time allotted	1	2	3	4	5
	With regard to the workshop implementation:					
1.9	Opportunity to socialize	1	2	3	4	5
1.10	Amount of materials received	1	2	3	4	5
1.11	Usefulness of materials received	1	2	3	4	5
1.12	Opportunity for professional development. .	1	2	3	4	5
1.13	Organization and operation of the workshop.	1	2	3	4	5
1.14	Time schedule of the workshop	1	2	3	4	5
1.15	Workshop location and facilities	1	2	3	4	5

APPENDIX D, continued

2. Please circle the number in the righthand low-high scale which best indicates the extent to which the workshop has aided in increasing your ability to:

		INCREASE				
		Low				High
2.1	Understand the cost-effectiveness concept as a developmental strategy for the improvement of vocational programs	1	2	3	4	5
2.2	Understand the cost-effectiveness concept as an analytical technique for evaluating vocational programs	1	2	3	4	5
2.3	Develop strategies to increase effectiveness of vocational programs	1	2	3	4	5
2.4	Develop strategies to increase cost efficiency of vocational programs . . .	1	2	3	4	5
2.5	Develop strategies to improve cost-effectiveness of vocational programs	1	2	3	4	5
2.6	Develop a set of vocational program objectives with specific target goals in measurable terms	1	2	3	4	5
2.7	Assess program output indicators relating to the specified program objectives	1	2	3	4	5
2.8	Determine the direct and indirect program costs per student, per student contact hour, and per completer or graduate in vocational programs	1	2	3	4	5
2.9	Compute program effectiveness measures of vocational programs	1	2	3	4	5
2.10	Compute cost efficiency measures of vocational programs	1	2	3	4	5
2.11	Compute cost-effectiveness and performance ratio of vocational programs . .	1	2	3	4	5
2.12	Disseminate new strategies and techniques for improving cost-effectiveness of vocational programs	1	2	3	4	5

APPENDIX D, continued

3. In terms of the contents presented and discussed at the workshop, how did you perceive the characteristics of the cost-effectiveness developmental strategies and analytical techniques? Please circle the number on the righthand column which best indicates the degree of your agreement with the following statements:

		AGREEMENT				
		Low				High
3.1	The cost-effectiveness developmental strategies are relatively better ideas than existing practices	1	2	3	4	5
3.2	The developmental strategies are consistent with the current direction of program improvements	1	2	3	4	5
3.3	The developmental strategies are easy to understand and practice	1	2	3	4	5
3.4	The developmental strategies can be experimented with on a limited basis	1	2	3	4	5
3.5	The results from the developmental strategies are visible to others	1	2	3	4	5
3.6	The cost-effectiveness analysis technique is relatively better than other evaluation techniques	1	2	3	4	5
3.7	The cost-effectiveness analysis technique is compatible with existing management skills	1	2	3	4	5
3.8	The cost-effectiveness analysis technique is easy to understand and use . .	1	2	3	4	5
3.9	The cost-effectiveness analysis can be implemented in a step-by-step process . . .	1	2	3	4	5
3.10	Cost-effectiveness results are feasible and communicable to others	1	2	3	4	5

APPENDIX D, continued

4. Please make comments on the workshop as a whole, and provide us with recommendations or suggestions for future action.

REPORTS FROM COST-EFFECTIVENESS STUDY PROJECTS

Kim, J.E. & Harris, R.C. *A cost-effectiveness analysis model for secondary vocational programs: Technical report.* Bloomington, IN: Indiana University, 1976. (ERIC Document Reproduction Service No. ED 130 081, CE 008 487)

Kim, J.E., Harris, R.C., & Ruby, D.D. *Cost-effectiveness analysis of secondary vocational programs: Administrator's manual.* Bloomington, IN: Indiana University, 1976. (ERIC Document Reproduction Service No. ED 130 082, CE 008 488)

Harris, R.C. & Kim, J.E. *Cost-effectiveness materials for locally conducted secondary school vocational education program investigations: Final report.* Bloomington, IN: Indiana University, 1976. (ERIC Document Reproduction Service No. ED 130 083, CE 008 489)

Kim, J.E. *A cost-effectiveness/benefit analysis model for postsecondary vocational programs: Technical report.* Bloomington, IN: Indiana University, 1977. (ERIC Document Reproduction Service No. ED 151 560)

Kim, J.E. *Cost-effectiveness/benefit analysis of postsecondary vocational programs: Administrator's manual.* Bloomington, IN: Indiana University, 1977. (ERIC Document Reproduction Service No. ED 151 559)

Kim, J.E. *Development of a cost-effectiveness/benefit analysis model and user's manual for postsecondary vocational programs: Final report.* Bloomington, IN: Indiana University, 1977.

Kim, J.E. *Diffusion of the cost-effectiveness analysis system for improving secondary vocational program management: A conceptual framework and a statewide conference.* Bloomington, IN: Indiana University, 1978.

Kim, J.E. *Developmental strategies and analytical techniques for improving cost-effectiveness of vocational programs: Handbook.* Bloomington, IN: Indiana University, 1978.

Kim, J.E. *National workshop and states' follow-up activities for improving cost-effectiveness of vocational programs: Workshop report.* Bloomington, IN: Indiana University, 1978.

Kim, J.E. *National priority training program #1: Developmental strategies and analytical techniques for improving cost-effectiveness of vocational programs: Final report.* Bloomington, IN: Indiana University, 1978.